ADHIKAANSH ACADEMY

(IITJEE NEET IX X XI XII)

RUN BY:

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QUESTION BANK MATHS

(CLASS 10TH) Term-1

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CHAPTER. –REAL NUMBERS

1. Find HCF of 231 and 396.

a) 231 b) 33 c) 27 d) 42

2. Find LCM of numbers whose prime factorization are expressible as 3×5^2 and $3^2 \times 5^2$.

a) 125 (b)15 (c) 75 (d) 225

3. How many prime factors are there in the prime factorization of 5005?

a) 2 b) 4 c) 6 d) 7

4. Which of the following rational numbers will have a terminating decimal expansion: ?

a) $\frac{71}{210}$ $b)\ \frac{29}{343}$ $c)\frac{63}{90}$ $d)\frac{15}{1700}$

5. The HCF and LCM of two numbers are 9 and 360 respectively. If one number is 45, the other number is:

a)720 b)36 c)240 d)72

6. Which has a terminating decimal expansion?

a)17/121 b) 29/343 c) 35/250 d)$\sqrt{19}$

7. If $x= 2^3 \times 3^1 \times 5^2$, $y=2^2 \times 3^3$, then HCF{x ,y} is?

a) 12 b) 108 c) 6 d)36

8)The LCM of two numbers is 90 times their HCF. The sum of LCM and HCF is 1456. If one of the number is 160, then what is the other number?

a) 120 b) 136 c) 144 d)184

9) The HCF of two consecutive natural numbers is

a) 2 b) 1 c) 4 d) 6

10) The largest number which divides 70 and 125 leaving remainders 5 and 8respectively is

a) 13 b) 65 c) 875 d) 1750

11) The product of a non-zero rational and an irrational number is

a) Always irrational b) always rational

c) Rational and irrational d) one

12) Find the LCM of 24, 60 and 150

a) 320 b) 540 c) 600 d) 125

13) Which of the following is the decimal expansion of an irrational number?

a) 5.46 b) 2.03003000300003…… c) 0.12121212…. d) 12

14) Decimal expansion of $\frac{23}{2^3 5^2}$ will be

a) Terminating b) non- terminating

c) Non-terminating and repeating d) Non-terminating and non- repeating

15) How many rational numbers are there between any two rational numbers?

a) one b) two c) three d) infinite

16. Three bells toll at intervals of 9, 12, 15 minutes respectively. If they start together, after what time they next toll together?

a) 225 minutes b) 180 minutes c) 3 minutes d) 45 minutes

17. 144 cartons of Coke cans and 90 cartons of Pepsi cans are to be stacked in a canteen. If each stack is of the same height and if it contains equal cartons of the same drink, what would be the greatest number of cartons each stack would have?

(a) 9 (b) 12 (c) 18 (d)20

18. Find the LCM of the smallest one digit composite number and smallest two digit composite number.

(a) 2 (b) 10 (c) 20 (d) 4

19. HCF of two numbers is 27 and their LCM is 162. If one of the numbers is 54, then what is the other number?

(a) 18 (b) 108 (c)81 (d) 112

20. After how many place of decimal will the decimal expansion of $\frac{14587}{1250}$ terminate?

a) 4 (b) 3 (c) 2 (d) 1

CASE STUDY - 1

21) There is a circular path around the ground. If Ram takes12 minutes to run around this circular path, while Geet takes 15 minutes for the same. If both start from the same point at same time and goes in the same direction, then answer the following questions.

i) They will meet again at what time?

a) 1 hour (b) 120 minutes (c) 5 minutes (d) 40 minutes

ii) How many more rounds will Ram take in 120 minutes than Geet?

a)1 (b) 2 (c) 10 (d) 8

iii) Find the middle rational number between 12 and 15.

(a) 10 (b) 13.5 (c) 12.2 (d) 6

iv) Calculate smallest 3- digit number where both will meet?

(a) 120 minutes (b) 100 minutes (c) 900 minutes (d) 980 minutes

v) Calculate product of HCF and LCM of 12 and 15.

a) 200 (b) 120 (c) 180 (d) 104

CASE STUDY 2

22. Lavanya wants to organize her birthday party. She is very happy on her birthday. She is very health conscious, thus she decided to serve fruits only in her birthday party. She has 36 apples and 60 bananas at home and decided to serve them. She wants to distribute fruits among guests. She does not want to discriminate among guests, so she decided to distribute fruits equally among all.

(i) How many maximum guests Lavanya can invite?

(a) 12 (b) 120 (c) 6 (d) 180

(ii) How many apples and bananas will each guest get?

(a) 3 apple 5 banana

(b) 5 apple 3 banana

(c) 2 apple 4 banana

(d) 4 apple 2 banana

(iii) Lavanya decide to add 42 mangoes also. In this case how many maximum guests Lavanya can invite ?

(a) 12 (b) 120 (c) 6 (d) 180

(iv) How many total fruits will each guest get?

(a) 6 apple 5 banana and 6 mangoes

(b) 6 apple 10 banana and 7 mangoes

(c) 3 apple 5 banana and 7 mangoes

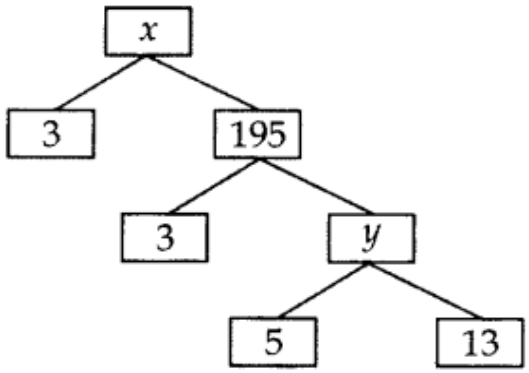
(d) 3 apple 10 banana and 6 mangoes

(v) If Lavanya decide to add 3 more mangoes and remove 6 apple in total fruits, in this case how

many maximum guests Lavanya can invite?

(a) 12 (b) 30 (c) 15 (d) 2

23. Complete the following factor tree and find the composite number x.



a) 600 (b) 585 (c) 225 (d) 325

24. Two tankers contain 850 liters and 680 liters of petrol. Find the maximum capacity of a container which can measure the petrol of each tanker in the exact number of times.

(a) 150 (b) 700 (c) 170 (d) 225

25. If the HCF of 408 and 1032 is expressible in the form 1032 x 2 + 408 x p, then find the value of p.

a) 16 (b) -5 (c) 6 (d) -14

26. Find HCF and LCM of 13 and 17.

a) 121 (b) 221 (c) 365 (d) 1331

27. Express 2658 as a product of its prime factors.

i) 2 x 13 x 17

ii) 3 x 2 x 443

iii) 2 x 7 x 11 x 13

iv) 2 x 2 x 3 x 3 x19

28) The prime factorization of a natural number is

a) Real and unique
b) Always same
c) Product of consecutive odd numbers
d) Can be any integer

29) 4^n Can end with digit zero. Choose the correct reason

a) Yes, if n=5
b) No. As prime factorization of 4 has no factor 5.
c) Yes . As 2 are factors of 4.
d) Both a and c

30) Product of any two natural numbers is

a) HCF of natural numbers.
b) LCM of natural numbers.
c) Product of HCF and LCM
d) All above.

ASSERTION AND REASON BASED QUESTIONS

DIRECTION: In the following questions, a statement of **assertion (A)** is followed by a statement of **Reason (R)** . Mark the correct choice as:

(a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A)
(b) Both assertion (A) and reason (R) are true and reason (R) is not the correct explanation of assertion (A)
(c) Assertion(A) is true but reason(R) is false.
(d) Assertion(A) is false but reason(R) is true.

31. **Assertion:** The HCF of two numbers is 18 and their product is 3072. Then their LCM is 169.

Reason: If a, b are two positive integers, then HCF x LCM=a x b.

(a) Both assertion (A) and reason (R) are true and reason(R) is the correct explanation of assertion (A).
(b) Both assertion (A) and reason (R) are true but reason(R) is not the correct explanation of assertion (A).

(c) Assertion (A) is true but reason (R) is false.

(d) Assertion (A) is false but reason (R) is true.

32. **Assertion:** $\mathbf{12^n}$ends with the digit zero, where n is any natural number.

Reason: Any number ends with digit zero, if its prime factor is of the form $2^m X 5^n$, where m and n are natural numbers.

(a) Both assertion (A) and reason (R) are true and reason(R) is the correct explanation of assertion (A).

(b) Both assertion (A) and reason (R) are true but reason(R) is not the correct explanation of assertion (A).

(c) Assertion (A) is true but reason (R) is false.

(d) Assertion (A) is false but reason (R) is true.

33. **Assertion:** Denominator of 12.145 when expressed in the form p/q, q≠0, is of the form $2^m X 5^n$, where m, n are non- negative integers.

Reason: 12.145 is a terminating decimal fraction.

(a) Both assertion (A) and reason (R) are true and reason(R) is the correct explanation of assertion (A).

(b) Both assertion (A) and reason (R) are true but reason(R) is not the correct explanation of assertion (A).

(c) Assertion (A) is true but reason (R) is false.

(d) Assertion (A) is false but reason (R) is true.

34. **Assertion:** (18, 25) is a pair of co-primes.

Reason: Pair of co-prime has a common factor 2.

(a) Both assertion (A) and reason (R) are true and reason(R) is the correct explanation of assertion (A).

(b) Both assertion (A) and reason (R) are true but reason(R) is not the correct explanation of assertion (A).

(c) Assertion (A) is true but reason (R) is false.

(d) Assertion (A) is false but reason (R) is true.

35. **Assertion:** $\sqrt{x}$ **is** an irrational number, where x is a prime number.

Reason: Square root of any prime number is an irrational number.

(a) Both assertion (A) and reason (R) are true and reason(R) is the correct explanation of assertion (A).

(b) Both assertion (A) and reason (R) are true but reason(R) is not the correct explanation of assertion (A).

(c) Assertion (A) is true but reason (R) is false.

(d) Assertion (A) is false but reason (R) is true.

36. **Assertion:** $\frac{29}{625}$ is a terminating decimal fraction.

Reason: If factors of denominator are any irrational number.

(a) Both assertion (A) and reason (R) are true and reason(R) is the correct explanation of assertion (A).

(b) Both assertion (A) and reason (R) are true but reason(R) is not the correct explanation of assertion (A).

(c) Assertion (A) is true but reason (R) is false.

(d) Assertion (A) is false but reason (R) is true.

37. Assertion: 3 x 5 x 7 + 7 is a composite number.

Reason: A composite number has factors one, itself and any other natural number.

(a) Both assertion (A) and reason (R) are true and reason(R) is the correct explanation of assertion (A).

(b) Both assertion (A) and reason (R) are true but reason(R) is not the correct explanation of assertion (A).

(c) Assertion (A) is true but reason (R) is false.

(d) Assertion (A) is false but reason (R) is true.

38. Assertion: The values of the remainder r, when a positive integer (a) is divided by 3 are 0 and 1 only.

Reason: According to Euclid's Division Lemma {a=b q + r}, where $0 \leq r < b$ and r is an integer.

(a) Both assertion (A) and reason (R) are true and reason(R) is the correct explanation of assertion (A).

(b) Both assertion (A) and reason (R) are true but reason(R) is not the correct explanation of assertion (A).

(c) Assertion (A) is true but reason (R) is false.

(d) Assertion (A) is false but reason (R) is true.

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39. Assertion: The decimal expansion of the rational number $\frac{33}{2^2\ 5}$ will terminate after two decimal place.

Reason: The rational numbers are those numbers that exist in the form of p/q, where p and q are any integers and $q \neq 0$.

(a) Both assertion (A) and reason (R) are true and reason(R) is the correct explanation of assertion (A).

(b) Both assertion (A) and reason (R) are true but reason(R) is not the correct explanation of assertion (A).

(c) Assertion (A) is true but reason (R) is false.

(d) Assertion (A) is false but reason (R) is true.

40. Assertion: $(2-\sqrt{5})$ is an irrational number.

Reason: The sum or difference of a rational and an irrational number is irrational.

(a) Both assertion (A) and reason (R) are true and reason(R) is the correct explanation of assertion (A).

(b) Both assertion (A) and reason (R) are true but reason(R) is not the correct explanation of assertion (A).

(c) Assertion (A) is true but reason (R) is false.

(d) Assertion (A) is false but reason (R) is true.

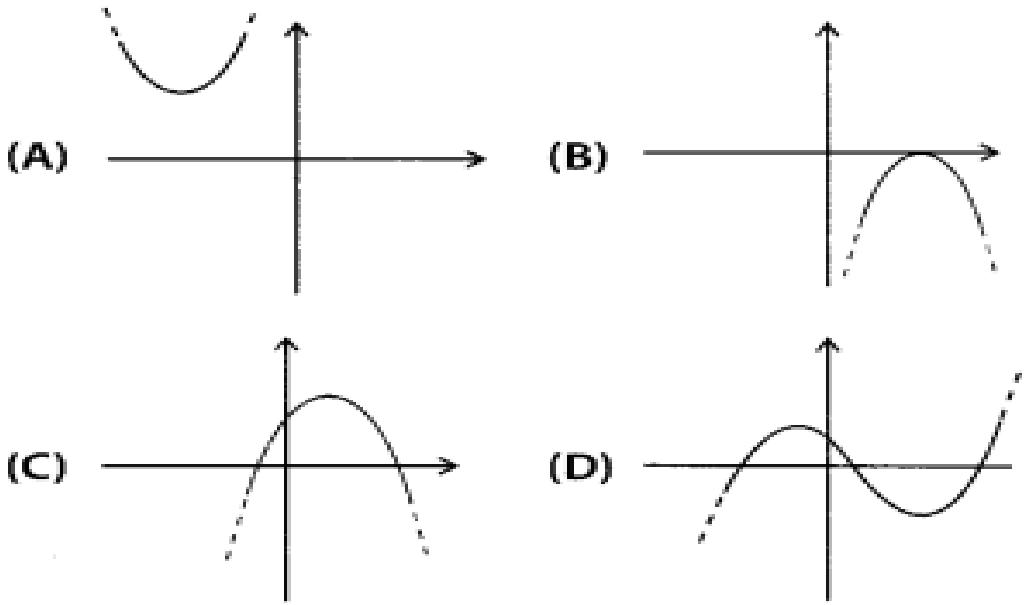
CHAPTER – POLYNOMIALS

1. The number of polynomials having zeroes as -2 and 5 is

   (A) 1 (B) 2

   (C) 3 (D) more than 3

2. Which of the following is not the graph of a quadratic polynomial?



3. Find the sum of the zeroes of the given quadratic polynomial $-3x^2 + k$

   (A) 0 (B) 1

   (C) 2 (D) 3

4. Zeroes of $\sqrt{3}x^2 + 10x + 7\sqrt{3}$ are

   (A) $\sqrt{3}, \frac{7}{\sqrt{3}}$ (B) $-\sqrt{3}, \frac{7}{\sqrt{3}}$

   (C) $\sqrt{3}, -\frac{7}{\sqrt{3}}$ (D) $-\sqrt{3}, -\frac{7}{\sqrt{3}}$

5. Graph of quadratic polynomial is a

   (A) Straight line (B) Circle

   (C) Parabola (D) Ellipse

6. A quadratic polynomial whose one zero is 5 and product of zeroes is 0 is

(A) $x^2 - 5$ (B) $x^2 - 5x$

(C) $5x^2 + 1$ (D) $x^2 + 5$

7. If one of the zeroes of the quadratic polynomial $(k - 1)x^2 + kx + 1$ is -3, then the value of k is

(A) $\frac{4}{3}$ (B) $-\frac{4}{3}$

(C) $\frac{2}{3}$ (D)) $-\frac{2}{3}$

8. A quadratic polynomial, whose zeroes are -3 and 4, is

(A) $x^2 - x + 12$

(B) $x^2 + x + 12$

(C) $\frac{x^2}{2} - \frac{x}{2} - 6$

(D) $2x^2 + 2x - 24$

9. If the zeros of the quadratic polynomial $x^2 + (a + 1)x + b$ are $2\ and\ -3$ then

(A) $a = -7, b = -1$ (B) $a = 5, b = -1$

(C) $a = 2, b = -6$ (D) $a = 0, b = -6$

10. If one zero of $p(x) = ax^2 + bx + c$ is zero, then the value of c will be

(A) -1 (B) 0

(C) 1 (D) 2

11. Zeroes of the polynomial can be determined graphically. Number of zeroes of a polynomial $y = p(x)$ for some polynomial $p(x)$ is equal to number of points where the graph of the polynomial

(A) Intersects y-axis (B) Intersects x-axis

(C) Intersects y-axis or intersects x-axis (D) None of these

12. For what value of k, is 3 a zero of polynomial $2x^2 + x + k$?

(A) 15 (B) 21

(C) -21 (D) -15

13. the product of zeroes of $-2x^2 + kx + 6$ is

(A) $-\frac{1}{2}$ (B) $\frac{1}{2}$ (C) 3 (D) -3

14. The polynomial in which the product and sum of zeroes are $-\frac{9}{2}, -\frac{3}{2}$ is

(A) $k(-2x^2 + 3x + 9)$ (B) $k(2x^2 - 3x - 9)$

(C) $k(2x^2 + 3x - 9)$ (D) $k(2x^2 + 3x + 9)$

15. If one zero of the quadratic polynomial $f(x) = 4x^2 - 8kx + 8x - 9$ is negative of the other, then zeroes of $kx^2 + 3kx + 2$ will be

(A) $x = -2, x = -1$ (B) $x = 2, x = 1$

(C) $x = -2, x = 1$ (D) $x = 2, x = -1$

16. If one zero of the quadratic polynomial $2x^2 - 3x + p$ is three, then other zero and the value of p will be

(A) $\frac{3}{2}, 9$ (B) $\frac{3}{2}, -9$

(C) $-\frac{3}{2}, 9$ (D)$-\frac{3}{2}, -9$

17. Quadratic polynomial whose zeroes are $-9\ and\ -\frac{1}{9}$ is

(A) $9x^2 - 82x + 9$ (B) $9x^2 + 82x + 9$

(C) $9x^2 + 82x - 9$ (D) $9x^2 - 82x - 9$

18. If α, β are zeroes of the polynomial $p(x) = x^2 - k(x + 1) - p$ such that $(\alpha + 1)(\beta + 1) = 0$ then the value of p will be

(A) 1 (B) -1

(C) 0 (D) None of these

19. If sum of the zeroes of quadratic polynomial $ky^2 + 2y - 3k$ is equal to twice their product, the value of k will be

(A) $-\frac{1}{3}$ (B) -3

(C) $\frac{1}{3}$ (D) 3

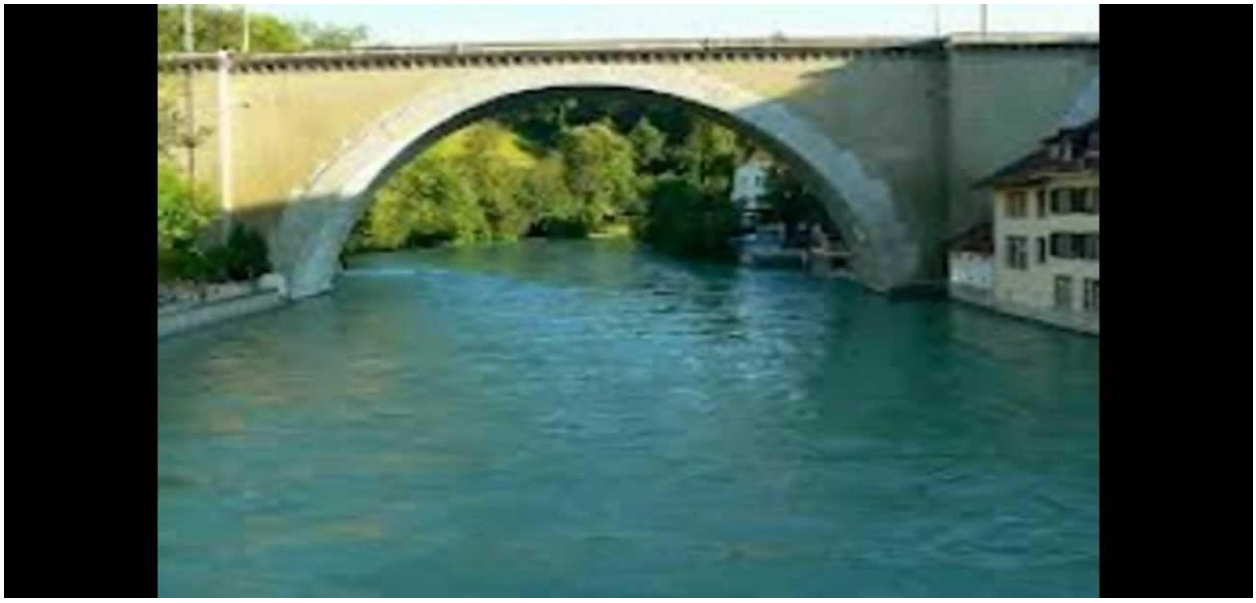
20. If α, β are zeroes of the polynomial $2y^2 + 7y + 5$, then the value of $\alpha + \beta + \alpha\beta$ will be

(A) -1 (B) 0

(C) 1 (D) 2

CASE STUDY 1:

The below picture are few natural examples of parabolic shape which is represented by a quadratic polynomial. A parabolic arch is an arch in the shape of a parabola. In structures, their curve represents an efficient method of load, and so can be found in bridges and in architecture in a variety of forms.



21. In the standard form of quadratic polynomial, $ax^2 + bx + c$, a, b and c are

a) All are Polynomials.

b) All are rational numbers.

c) All are real number and a ≠0

d) All are integers.

22. In the standard form of quadratic polynomial, $ax^2 + bx + c$, sum and product of zeroes are

a) a, b

b) b, c

c) $\frac{-c}{a}, \frac{b}{a}$

d) $\frac{-b}{a}, \frac{c}{a}$

23. If α and $\frac{1}{\alpha}$ are the zeroes of the quadratic polynomial $2x^2 - x + 8k$, then k is

a) 4

b) 1/4

c) –1/4

d) 2

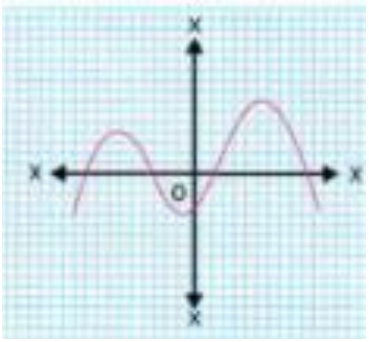
24. The number of zeroes of $y = p(x)$ for some polynomial $p(x)$ whose graph is as shown below is / are :

a) 1

b) 2

c) 3

d) 4



25. If the sum of the roots is –p and product of the roots is –1/p, then the quadratic polynomial is

a) $k\left(-px^2 + \frac{x}{p} + 1\right)$

b) $k\left(-px^2 - \frac{x}{p} - 1\right)$

c) $k\left(x^2 + px - \frac{1}{p}\right)$

d) $k\left(x^2 - px + \frac{1}{p}\right)$

CASE STUDY- 2:

An asana is a body posture, originally and still a general term for a sitting meditation pose, and later extended in hatha yoga and modern yoga as exercise, to any type of pose or position, adding reclining, standing, inverted, twisting, and balancing poses. In the figure, one

can observe that poses can be related to representation of quadratic polynomial.

26. The shape of the poses shown is

a) Spiral b) Ellipse c) Linear d) Parabola

27. The graph of a quadratic Polynomial $ax^2 + bx + c$, a $\neq 0$ is in the form of a parabola. A parabola is roughly shaped like the letter 'U' or upside-down 'U'. **The graph of parabola opens downwards, if _____**

a) $a \geq 0$ b) $a = 0$ c) $a < 0$ d) $a > 0$

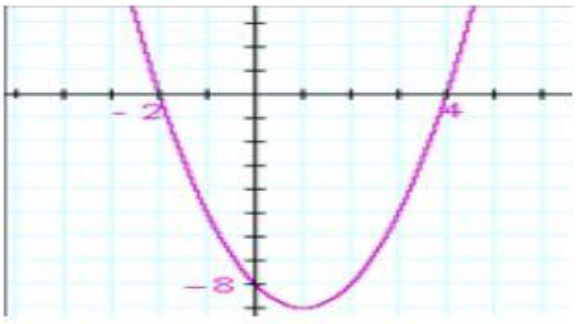
28. In the graph as shown below, how many zeroes are there for the polynomial?

a) 0

b) 1

c) 2

d) 3



29. The zeroes in the above shown graph are

a) -8 only b) -2, 4 c) -2, -8 and 4 d) None

30. The zeroes of the quadratic polynomial $4\sqrt{3}x^2 + 5x - 2\sqrt{3}$ are

a) $\frac{2}{\sqrt{3}}, \frac{\sqrt{3}}{4}$ b) $-\frac{2}{\sqrt{3}}, \frac{\sqrt{3}}{4}$

c) $\frac{2}{\sqrt{3}}, -\frac{\sqrt{3}}{4}$ d) $-\frac{2}{\sqrt{3}}, -\frac{\sqrt{3}}{4}$

ASSERTION AND REASON BASED QUESTIONS

DIRECTION: in the following questions, a statement of **assertion (A)** is followed by a statement of **Reason (R)** . Mark the correct choice as:

(e) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A)

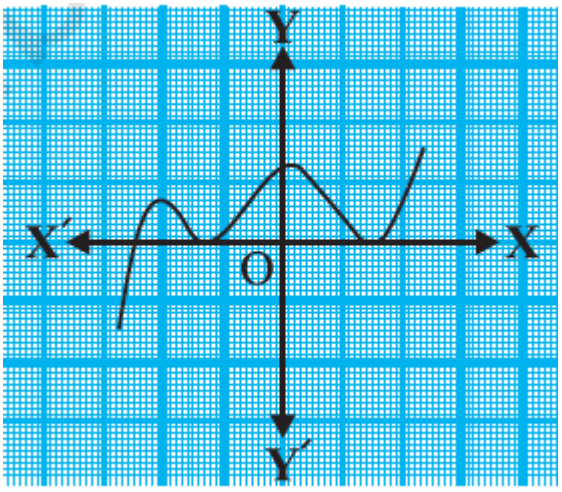
(f) Both assertion (A) and reason (R) are true and reason (R) is not the correct explanation of assertion (A)

(g) Assertion(A) is true but reason(R) is false.

(h) Assertion(A) is false but reason(R) is true.

31. Assertion: The graph y= f(x) is shown in figure, for the polynomial f(x). The number of zeros of f(x) is 3.

Reason: The number of zero of the polynomial f(x) is the number of point of which f(x) cuts or touches the axes.



(a)Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A)

(b) Both assertion (A) and reason (R) are true and reason (R) is not the correct explanation of assertion (A)

(c) Assertion (A) is true but reason (R) is false.

(d) Assertion (A) is false but reason (R) is true.

32. Assertion: If one zero of polynomial p(x)= $(k^2 + 4)x^2 + 13x + 4k$ is reciprocal of other, then k=2.

Reason: If (x-a) is a factor of p(x), then p(a)= 0 i.e. a is zero of p(x).

(a)Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A)

(b) Both assertion (A) and reason (R) are true and reason (R) is not the correct explanation of assertion (A)

(c) Assertion (A) is true but reason (R) is false.

(d) Assertion (A) is false but reason (R) is true.

33. Assertion: Degree of a zero polynomial is not defined.

Reason: Degree of a non-zero constant polynomial is 0.

(a)Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A)

(b) Both assertion (A) and reason (R) are true and reason (R) is not the correct explanation of assertion (A)

(c) Assertion (A) is true but reason (R) is false.

(d) Assertion (A) is false but reason (R) is true.

34. Assertion : P(x)= $4x^3 - x^2 + 5x^4 + 3x - 2$ is a polynomial of degree 3.

Reason : The highest power of x in the polynomial P(x) is the degree of the polynomial.

(a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A)

(b) Both assertion (A) and reason (R) are true and reason (R) is not the correct explanation of assertion (A)

(c) Assertion (A) is true but reason (R) is false.

(d) Assertion (A) is false but reason (R) is true.

35. Assertion : $x^3 + x$ Has only one real zero.

Reason: A polynomial of nth degree must have n real zeroes.

(a)Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A)

(b) Both assertion (A) and reason (R) are true and reason (R) is not the correct explanation of assertion (A)

(c) Assertion (A) is true but reason (R) is false.

(d) Assertion (A) is false but reason (R) is true.

36. Assertion: $x^2 + 7x + 12$ has no real zeroes.

Reason: A quadratic polynomial can have at the most two zeroes.

(a)Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A)

(b) Both assertion (A) and reason (R) are true and reason (R) is not the correct explanation of assertion (A)

(c) Assertion (A) is true but reason (R) is false.

(d) Assertion (A) is false but reason (R) is true.

37. Assertion: If the sum of the zeroes of the quadratic polynomial $x^2 - 2kx + 8$ is 2 then value of k is 1.

Reason: Sum of zeroes of quadratic polynomial $ax^2 + bx + c$ is $-\frac{b}{a}$

(a)Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A)

(b) Both assertion (A) and reason (R) are true and reason (R) is not the correct explanation of assertion (A)

(c) Assertion (A) is true but reason (R) is false.

(d) Assertion (A) is false but reason (R) is true.

38. Assertion: If the product of the zeroes of the quadratic polynomial $x^2 + 3x + 5k$ is -10 then the value of k is -2 .

Reason: Sum of zeroes of quadratic polynomial $ax^2 + bx + c$ is $-\frac{b}{a}$

(a)Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A)

(b) Both assertion (A) and reason (R) are true and reason (R) is not the correct explanation of assertion (A)

(c) Assertion (A) is true but reason (R) is false.

(d) Assertion (A) is false but reason (R) is true.

39. Assertion : $3 - 2\sqrt{5}$ is one zero of the quadratic polynomial then other zero will be $3 + 2\sqrt{5}$

Reason : Irrational zeros (roots) always occurs in pairs.

(a)Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A)

(b) Both assertion (A) and reason (R) are true and reason (R) is not the correct explanation of assertion (A)

(c) Assertion (A) is true but reason (R) is false.

(d) Assertion (A) is false but reason (R) is true.

40. Assertion: A quadratic polynomial , sum of whose zeroes is 8 and their product is 12 is $x^2 - 20x + 96$.

Reason: If α and β are the zeroes of the polynomial f(x), then the polynomial is given by $x^2 - (\alpha + \beta)x + \alpha\beta$

(a)Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A)

(b) Both assertion (A) and reason (R) are true and reason (R) is not the correct explanation of assertion (A)

(c) Assertion (A) is true but reason (R) is false.

(d) Assertion (A) is false but reason (R) is true.

CHAPTER –LINEAR EQUATIONS IN TWO VARIABLES

KEY NOTES:-

- For any linear equation, each solution (x, y) corresponds to a point on the line. General form is given by **ax + by + c = 0.**
- The graph of a linear equation is a straight line.
- Two linear equations in the same two variables are called a pair of linear equations in two variables. The most general form of a pair of linear equations is: $\mathbf{a_1x + b_1y + c_1 = 0; a_2x + b_2y + c_2 = 0}$

  where a_1, a_2, b_1, b_2, c_1 and c_2 are real numbers, such that $a_1^2 + b_1^2 \neq 0$, $a_2^2 + b_2^2 \neq 0$.
- A pair of values of variables 'x'and 'y' which satisfy both the equations in the given system of equations is said to be a solution of the simultaneous pair of linear equations.
- A pair of linear equations in two variables can be represented and solved, by
  (i) Graphical method
  (ii) Algebraic method

MCQ

1. One equation of a pair of dependent linear equations (having infinite many solutions) is 2x + 5y = 3. The second equation will be

(a) 2x + 5y = 6 (b) 3x + 5y = 3

(c) -10x – 25y + 15 = 0 (d) 10x - 25y = 15

2. The value of k, for which equations 3x + 5y = 0 and kx + l0y = 0 has a non-zero solution is

(a) 6 (b) 0 (c) 2 (d) 5

3. The pair of equations x = a and y = b graphically represents lines which are

(a) Parallel (b) Intersecting at (b, a)

(c) Coincident (d) Intersecting at (a, b)

4. The sum of the digits of a two-digit number is 9. If 27 is added to it, the digits of the number get reversed. The number is

(a) 27 (b) 72 (c) 45 (d) 36

5. The graph of the equation $2x + 3y = 5$ is a

(a) Vertical line (b) Straight line (c) Horizontal line (d) None of these

6. If a pair of linear equations is consistent, then the lines are:

(a)Parallel (b)Always coincident (c)Always intersecting (d)Intersecting or coincident

7. If $29x + 37y = 103$, $37x + 29y = 95$ then:

(a) $x = 1, y = 2$ (b) $x = 2, y = 1$

(c) $x = 2, y = 3$ (d) $x = 3, y = 2$

8. The pair of equations $y = 0$ and $y = -7$ has

(a) One solution (b) Two solutions

(c) Infinitely many solutions (d) No solution

9. If $x = a, y = b$ is the solution of the equation $x – y = 2$ and $x + y = 4$, then the value of a and b are respectively

(a) 3 and 5 (b) 5 and 3 (c) 3 and 1 (d) -1 and -3

10. If the system of equations $2x + 3y = 7$

$2ax + (a + b) y = 28$ has infinitely many solutions, then

(a) $a = 2b$ (b) $b = 2a$

(c) $a + 2b = 0$ (d) $2a + b = 0$

11. A fraction becomes 4/5 when 1 is added to each of the numerator and denominator. However, if we subtract 5 from each then it becomes 1/2. The fraction is –

(a) 5/8 (b) 5/6 (c) 7/9 (d) 13/16

12. 3 women and 6 men can together finish a tailoring job in 5 days, while 4 women and 7 men can finish it in 4 days. Find the time taken by 1 woman alone to finish the work, and also that taken by 1 man alone. The linear equations (in standard form) to solve this problem algebraically are

(a) $15u + 30v – 1 = 0$; $16u + 28v – 1 = 0$

(b) $15x – 30y + 1 = 0$; $16x + 28y + 1 = 0$

(c) $16u + 30v – 1 = 0$; $16u + 28v – 1 = 0$

(d) $16x + 30y – 1 = 0$; $16x + 28y – 1 = 0$

13. Coordinates of point, such that line $3x+4y=12$ meets x axis is

(a) (0, 4) (b) (4, 0) (c) (3, 0) (d) (0, 3)

14. Value of y satisfying both the equations $x+6=y$ and $2x-y=4$

(a) 10 (b) -10 (c) 16 (d) -16

15. If $bx-ay=a+b$ and $ax+by=a-b$, then value of x/y is

(a) 0 (b) -1 (c) 2 (d) 1

16. If the lines $3x+2ky – 2 = 0$ and $2x+5y+1 = 0$ are parallel, then what is the value of k?

(a) 4/15 (b) 15/4 (c) 4/5 (d) 5/4

17. The solution of $4/x+3y=14$ and $3/x-4y=23$ is:

(a) ⅕ and -2 (b) ⅓ and ½

(c) 3 and ½ (d) 2 and ⅓

18.The angles of cyclic quadrilaterals ABCD are: $A = (6x+10)$, $B=(5x)°$, $C = (x+y)°$ and $D=(3y-10)°$. The value of x and y is:

(a) $x=20°$ and $y = 10°$ (b) $x=20°$ and $y = 30°$

(c) $x=44°$ and $y=15°$ (d) $x=15°$ and $y=15°$

19. The value of c for which the pair of equations $cx – y = 2$ and $6x – 2y = 3$ will have infinitely many solutions is

(a) 3 (b) -3 (c) -12 (d) No value

20. Two equations in two variables taken together are called

(a) Linear equations (b) Quadratic equations

(c) Simultaneous equations (d) None of these

21. If $am \neq bl$, how many solutions do the pair of equations $ax+by=c$; $lx +my=n$ have

(a) Only one solution (b) two solutions (c) zero solution (d) infinite many solutions

22. Value of 'a' so that the point (2, 9) lies on the line represented by ax-3y=5 is

(a) 11 (b) -11 (c) -16 (d) 16

23. Asha has only ₹1 and ₹2 coins with her. If the total number of coins that she has is 50 and the amount of money with her is ₹75, then the number of ₹1 and ₹2 coins are, respectively

(a) 35 and 15 (b) 15 and 35

(c) 35 and 20 (d) 25 and 25

24. The father's age is six times his son's age. Four years hence, the age of the father will be four times his son's age. The present ages of the son and the father are, respectively

(a) 4 and 24 (b) 5 and 30

(c) 6 and 36 (d) 3 and 24

Case study questions

1. Two very intelligent and hardworking brothers Sanjay and Rahul support their parents by taking tuitions. The ratio of the income they made be from the tuition are in the ratio 9:7 respectively and the ratio of their monthly expenditure is 4:3 and each of them manages to save rupees 2000 per month. On basis of above situation answer the following questions.

(i) linear equations representing income with variable x and expenditures with variable y are

(a) 9x -7y=2000; 4x-3y=2000, (b) 9x-4y=2000; 7x-3y=2000 ,

(c) 9x-3y=2000; 7x-4y=2000 (d) 9x +7y=2000; 4x+3y=2000

(ii) Find the monthly income of both brothers.

(a) ₹33000 (b) ₹30000 (c) ₹32000 (d) ₹40000

(iii) Find monthly expenditure of Rahul.

(a) ₹12000 (b) ₹10000 (c) ₹12500 (d) ₹11600

(iv)In how many months both of them will manage to buy a laptop of worth 44000 with their saving.

(a)10 months (b)11 months (c) 9 months (d) 8 months

2. Due to hike in petrol and diesel prices, different types of vehicles like auto, Rickshaws, taxis, Radio cab etc. The auto charges in a city comprise of a fixed charge together with the charge for the distance covered. Study the following situation:

Name of city	Distance trevelled (in Km)	Fare (in ₹)
Delhi	10	75
	15	110

Situation 1: In Delhi, for a journey of 10 km, the charge paid is Rs 75 and for a journey of 15 km, the charge paid is Rs 110.

Based on the above layout and situation, answer the following questions:

(i) How this situation can be expressed algebraically in the form of pair of linear equations in two variables?

(a) x+10y =75 ; x+15y =110 (b) x+15y =110 ; x-9y =75

(c) x-9y =75; x - 14y=110 (d) x - 14y=110; x+10y =75

(ii) What is fixed charge and charge per km.

(a) ₹5, ₹7 (b) ₹7, ₹5 (c) ₹2, ₹5 (d) ₹5, ₹6

(iii) Find fare of auto rickshaw for 50km distance in Delhi.

(a) 345 , (b) 355 (c) 455 (d) 305

3. Yash and his son Vaibhav were playing riddles. When Vaibhav ask age of his father, Yash replied in language of riddle, After five years I will be three times of your age. And five years ago,I was seven times of your age. On basis of above situation, answer the following questions.

(i) Linear equation representing age of Yash and Vaibhav after five years taking age of Yash as x and age of vaibhav as y years is

(a) 3x +y =10 (b) x-3y =10 (c) x-3y =-10 (d) 3x-y =10

(ii) Find present age of Yash

(a) 30 years (b) 41 years (c) 40 years (d) 42 years

(iii)What will be age of Vaibhav after 10 years?

(a) 20 years (b)25 years (c) 24years (d) 30years

(iii) Find the ratio of their ages after 5 years.

(a) 2:1 (b) 3:1 (c) 4:3 (d) 1:2

4. Rohan bought 3 notebooks and 2 pens for ₹80.His friend Atul said that the price of each notebook could be ₹25. Then 3 note books would cost ₹75 the two pens would cost ₹5 and each pen costs ₹ 2.50 .Another friend Ajay felt that ₹ 2.50 for one pen was too little it should be at least rupees 16 then the price of each notebook would also be rupees 16. Rohit also bought the same types of notebooks and pens as Rohan. He paid rupees 110 for 4 notebooks and three pen later Rohan guess the cost of one pen is rupees 10 and Rohit guess the cost of one notebook is rupees 30.

On the basis of above situation answer the following questions

(i) The pair of linear equations in two variables from this situation by taking cost of one notebook is Rupees x and cost of one pen rupees y.

(a) 3 X + 2 Y = 80; 4 x + 3 Y =110 (b) 2 X + 3 Y = 80; 3 X + 4 Y = 110

(c) X + Y = 80; X + Y =110 (d) 3 X + 2 Y =110; 4 x + 3 Y = 80

(ii) The cost of one notebook is

(a) ₹ 20 (b) ₹10 (c) ₹ 5 (d) 15

(iii) Cost of one pen is

(a)₹ 20 (b) ₹10 (c) 5 (d) 15

(iv) Find whose estimation is correct.

(a) Rohan (b) Rohit (c) Atul (d) Ajay

ASSERTION AND REASON BASED QUESTIONS

DIRECTION: in the following questions, a statement of **assertion (A)** is followed by a statement of **Reason (R)** . Mark the correct choice as:

(a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A)

(b) Both assertion (A) and reason (R) are true and reason (R) is not the correct explanation of assertion (A)

(c) Assertion(A) is true but reason(R) is false.

(d) Assertion(A) is false but reason(R) is true.

1. Assertion:

The linear equations $x-2y-3=0$ and $3x+4y-20=0$ have exactly one solution.

Reason:

The linear equations $2x+3y-9=0$ and $4x+6y-18=0$ have a unique solution.

A. Both Assertion and Reason are correct and Reason is the correct explanation for Assertion.

B. Both Assertion and Reason are correct but Reason is not the correct explanation for Assertion.

C. Assertion is correct but Reason is incorrect.

D. Assertion is incorrect but Reason is correct.

2. Assertion: If the pair of lines are coincident, then we say that pair of lines is consistent and it has a unique solution.

Reason: if the pair of lines are parallel then the pair has no solution and is called inconsistent pair of equations.

A. Both Assertion and Reason are correct and Reason is the correct explanation for Assertion.

B. Both Assertion and Reason are correct but Reason is not the correct explanation for Assertion.

C. Assertion is correct but Reason is incorrect.

D. Assertion is incorrect but Reason is correct.

3. Assertion: The graph of the linear equations $3x+2y=12$ and $5x-2y=4$ gives a pair of intersecting lines.

Reason: The graph of linear equations $a_1 x + b_1 y + c_1 = 0$ and $a_2 x + b_2 y + c_2 = 0$ gives pair of intersecting lines if a_1 / a_2 is not equal to b_1 / b_2.

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A. Both Assertion and Reason are correct and Reason is the correct explanation for Assertion.

B. Both Assertion and Reason are correct but Reason is not the correct explanation for Assertion.

C. Assertion is correct but Reason is incorrect.

D. Assertion is incorrect but Reason is correct.

4. Assertion: The graphic representation of the equations X + 2y = 3 and 2 X + 4 Y +7 = 0 gives a pair of coincident lines

Reason: The graph of linear equations $a_1 x + b_1 y + c_1 = 0$ and $a_2 x + b_2 y + c_2 = 0$ gives pair of coincident lines if $a_1 / a_2 = b_1 / b_2 = c_1 / c_2$

A. Both Assertion and Reason are correct and Reason is the correct explanation for Assertion.

B. Both Assertion and Reason are correct but Reason is not the correct explanation for Assertion.

C. Assertion is correct but Reason is incorrect.

D. Assertion is incorrect but Reason is correct.

5. Assertion: The value of k for which the system of equations 3 X + K Y = 0 ,2 x - y = 0 has unique solution if K is not equal to -3 / 2.

Reason: The system of linear equations $a_1 x + b_1 y + c_1 = 0$ and $a_2 x + b_2 y + c_2 = 0$ gives unique solution if a_1 / a_2 is not equal to b_1 / b_2.

A. Both Assertion and Reason are correct and Reason is the correct explanation for Assertion.

B. Both Assertion and Reason are correct but Reason is not the correct explanation for Assertion.

C. Assertion is correct but Reason is incorrect.

D. Assertion is incorrect but Reason is correct.

6. Assertion: The number of common solutions of the system of linear equations 5 x + 4 Y + 6 = 0 and 10 X + 8 Y = 12 is zero.

Reason: The system of linear equations $a_1 x + b_1 y + c_1 = 0$ and $a_2 x + b_2 y + c_2 = 0$ gives unique solution if a_1 / a_2 is not equal to b_1 / b_2.

A. Both Assertion and Reason are correct and Reason is the correct explanation for Assertion.

B. Both Assertion and Reason are correct but Reason is not the correct explanation for Assertion.

C. Assertion is correct but Reason is incorrect.

D. Assertion is incorrect but Reason is correct.

7. Assertion: the value of k for which the system of linear equations 3 x- 4 Y = 7 and 6 x - 8 Y =k have infinite number of solution is 14.

Reason: The system of linear equations $a_1 x + b_1 y + c_1 = 0$ and $a_2 x + b_2 y + c_2 = 0$ gives unique solution if a_1 / a_2 is not equal to b_1 / b_2.

A. Both Assertion and Reason are correct and Reason is the correct explanation for Assertion.

B. Both Assertion and Reason are correct but Reason is not the correct explanation for Assertion.

C. Assertion is correct but Reason is incorrect.

D. Assertion is incorrect but Reason is correct.

8. Assertion: a pair of linear equation has no solution if it is represented by intersecting lines graphically.

Reason: if the pair of lines are intersecting then the pair has unique solution and is called consistent pair of equations.

A. Both Assertion and Reason are correct and Reason is the correct explanation for Assertion.

B. Both Assertion and Reason are correct but Reason is not the correct explanation for Assertion.

C. Assertion is correct but Reason is incorrect.

D. Assertion is incorrect but Reason is correct.

9. Assertion: The value of q= ± 2, if x=3, y=1 is the solution of the line $2x+y-q^2-3=0$.

Reason: the solution of the line will satisfy the equation of the line.

A. Both Assertion and Reason are correct and Reason is the correct explanation for Assertion.

B. Both Assertion and Reason are correct but Reason is not the correct explanation for Assertion.

C. Assertion is correct but Reason is incorrect.

D. Assertion is incorrect but Reason is correct.

10. Assertion: the value of k for which the system of linear equations kx- y =2 and 6 x -2 y = 3 has a unique solution is 3.

Reason: The system of linear equations $a_1 x + b_1 y + c_1 = 0$ and $a_2 x + b_2 y + c_2 = 0$ gives unique solution if a_1 / a_2 is not equal to b_1 / b_2.

A. Both Assertion and Reason are correct and Reason is the correct explanation for Assertion.

B. Both Assertion and Reason are correct but Reason is not the correct explanation for Assertion.

C. Assertion is correct but Reason is incorrect.

D. Assertion is incorrect but Reason is correct.

CHAPTER –TRIANGLES

MCQ

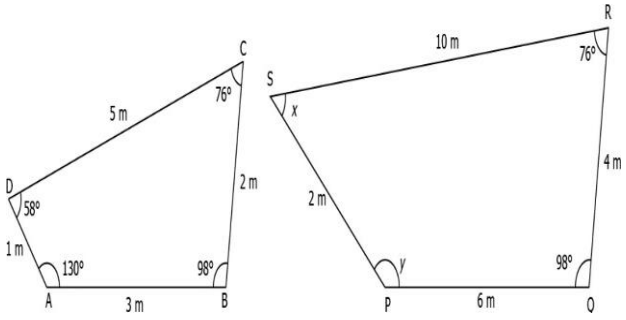
Q.1 Rahul claims that congruent figures are similar as well. Aman claims that similar figures are congruent as well. Who is/are correct?

(a) Only Rahul (b) only Aman (c) Both Rahul and Aman (d) Neither Rahul nor Aman,

Q.2.All the …….triangles are similar

(a) Isosceles (b) Equilateral (c) Scalene (d) None of these

Q.3. Two similar figures are shown.



What are the values of x and y?

(a) x = **58**°, y =130° (b) x = 9**8**°, y = 76° (c) x = 82°, y = 84° (d) x = 130°, y = 84°

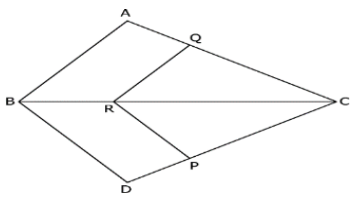
Q.4. If a line is drawn parallel to one side of a triangle, to intersect the other two sides in distinct points,

Then the other two sides are divided in the same ratio. This theorem is known as

(a) Basic Proportionality theorem (b) Pythagoras theorem (c) Mid- point theorem (d) Converse of Pythagoras

Q.5.In the given figure, $QR \parallel AB$, $RP \parallel BD$, $CQ = x + 2$, $QA = x$, $CP = 5x + 4$, PD = $3x$.

The value of x is _____.

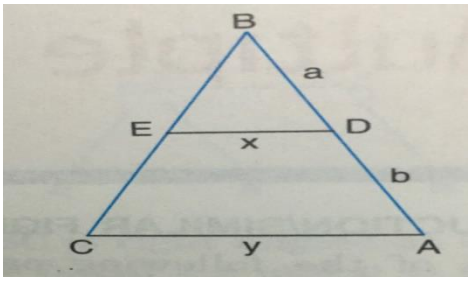


(a) 6 (b) 3 (c) 1 (d) 9

Q.6. In ΔABC , a line DE , drawn parallel to base BC, intersects the sides AB and AC at points D and E respectively .If AD =2,BD = 4 and DE = 2,then base BC is equal to

(a) 2 (b) 4 (c) 6 (d) 8

Q.7. In the given figure, DE ∥ AC, which of the following is true?



(a) x = $\frac{a+b}{ay}$ (b) y = $\frac{a\,x}{a+b}$ (c) x = $\frac{a\,y}{a+b}$ (d) $\frac{x}{y} = \frac{a}{b}$

Q.8. If in two triangles, corresponding angles are equal, and then the two triangles are similar. This criterion is known as

(a) SSS similarity criterion (b) SAS similarity criterion (c) AAA Similarity (d) None of these

Q.9.If in two triangles, two angles of one triangle are respectively equal to the two angles of the other triangle, and then the two triangles are similar. This criterion is known as

(a) SSS similarity criterion, (b) SAS similarity criterion, (c) AA similarity criterion (d) None of these.

Q.10. If in two triangles, corresponding sides are in the same ratio, and then the two triangles are similar. This criterion is known as

(a) SSS similarity criterion (b) SAS similarity criterion (c) AA similarity criterion (d) AAA criterion

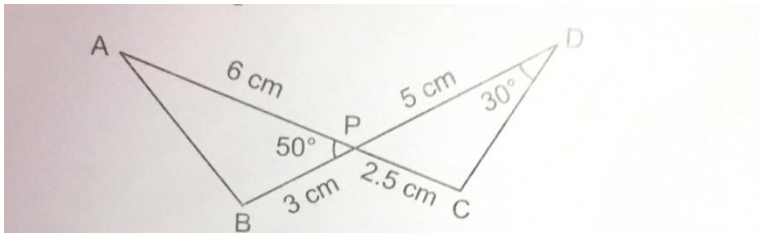
Q.11.If one angle of a triangle is equal to the one angle of the other triangle, and the sides including these angles are proportional, then the two triangles are similar. This criterion is known as

(a) SSS similarity criterion (b) SAS similarity criterion (c) AA similarity criterion (d) None of these

Q.12.If in two triangles DEF and QRP, $\angle D = \angle Q$, and $\angle R = \angle E$, then which of the following is not true?

(a) $\frac{EF}{PR} = \frac{DF}{PQ}$ (b) $\frac{DE}{PQ} = \frac{EF}{PR}$ (c) $\frac{DE}{QR} = \frac{DF}{PQ}$ (d) $\frac{EF}{PR} = \frac{DE}{QR}$

Q.13 In fig. two line segments AC and BD intersect each other at the point P such that PA = 6 cm, PB == 3cm PC = 2.5 cm, PD = 5cm, $\angle APB = 50^0$ and $\angle CDP = 30^0$,Then $\angle PBA$ is equal to



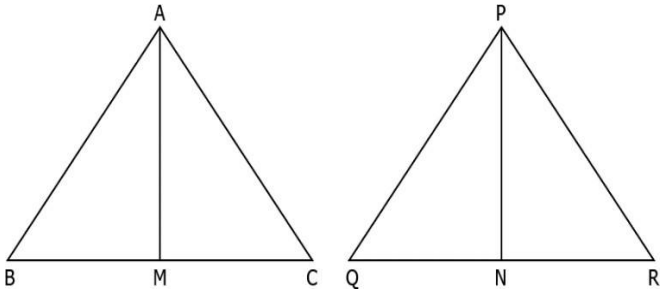
(a) 50^0 (b) 30^0 (c) 60^0 (d) 100^0

Q.14.The ratio of the areas of two similar triangles is equal to

(a) The ratio of their corresponding sides (b) the square of the ratio of their corresponding sides

(C) The cube of the ratio of their corresponding sides (d) the ratio of their corresponding altitudes.

Q.15 The ratio of the areas of two similar ΔABC and ΔPQR shown below is 25:144. What is the ratio of their medians AM and PN?



(a) 5:12 (b) 25:144 (c) 12: 5 (d) 5:16

Q.16. The ratio of the areas of two similar triangles is 9:16. The length of one of the sides of the smaller triangle is 15cm. How much longer is the length of the corresponding side of the larger triangle from smaller triangle?

(a) 3 cm (b) 4 cm (c) 5cm (d) 7 cm.

Q.17. In a right triangle, the square of the hypotenuse is equal to the sum of the squares of other two sides. This theorem is known as.

a) Converse of Pythagoras theorem (b) Pythagoras theorem

(c) Thales theorem (d) Converse of Thales theorem.

Q.18. which set of sides form a right angle triangle?

(a) 5cm, 12cm, 16cm (b) 7 cm, 24cm, 25cm

(c) 3cm, 3cm, 4cm (d) 6cm, 7cm, 9cm

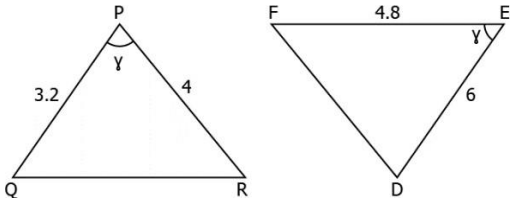
Q.19.In ΔABC and ΔEDF, $\angle A = \angle E = 40^0$, AB /ED = AC /EF and $\angle F = 65^0$, then $\angle B$

(a) 35^0 (b) 65^0 (c) 75^0 (d) 85^0

Q.20 In a square of side 10 cm, its diagonal = …

(a) 15 cm (b) $10\sqrt{2}$ cm (c) 20 cm (d) 12 cm

Q.21. Observe the two triangles shown below. Which statement is correct?



(a) Triangles are similar by SAS

(b) Triangles are similar by SSA

(c) Triangles are not similar as sides in proportion

(d) No valid conclusion about similar triangles can be made as angle measures are not known.

Q.22. In a rectangle Length = 8 cm, Breadth = 6 cm. Then its diagonal =

(a) 9 cm (b) 14 cm (c) 10 cm (d) 12 cm

Q.23ΔABC and ΔBDE are two equilateral triangles such that D is the midpoint of BC. Ratio of the areas of triangle ΔABC and ΔBDE is.

(a) 2 : 1 (b) 1 : 2 (c) 4 : 1 (d) 1 : 4

Q.24.If in ΔABC and ΔDEF, $\frac{AB}{DE} = \frac{BC}{FE} = \frac{CA}{FD}$, then

(a) $\Delta FDE \sim \Delta CAB$ (b) $\Delta FDE \sim \Delta ABC$ (c) $\Delta CBA \sim \Delta FDE$ (d) $\Delta BCA \sim \Delta FDE$

Q.25.If in ΔABC and ΔEDF, $\frac{AB}{DE} = \frac{BC}{FD}$, then $\Delta ABC \sim \Delta EDF$ when

(a) $\angle A = \angle F$ (b) $\angle A = \angle D$ (c) $\angle B = \angle D$ (d) $\angle B = \angle E$,

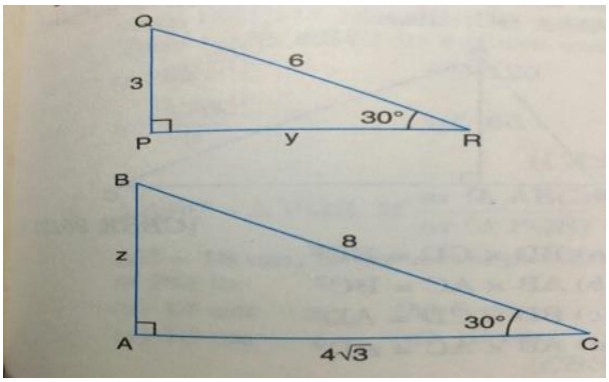
Q.26.In an isosceles triangle ABC if AC = BC and $AB^2 = 2AC^2$, then $\angle C$

(a) 30^0 (b) 45^0 (c) 90^0 (d) 60^0

Q.27. $\Delta ABC \sim \Delta DEF$ such that AB = 4cm, CA = 2.5cm, BC = 3.5cm and DF = 7.5 , then perimeter of ΔDEF is

(a) 10 cm (b) 14 cm (c) 30 cm (d) 25 cm

Q.28.If $\Delta ABC \sim \Delta PQR$,then y + z is equal to



(a) $2 + \sqrt{3}$ (b) $4 + 3\sqrt{3}$ (c) $4 + \sqrt{3}$ (d) $3 + 4\sqrt{3}$

Q.29.The length of the shadow of a 12cm long vertical rod is 8 cm .At the same time, the length of the shadow of a tower is 40 cm. Find the height of tower

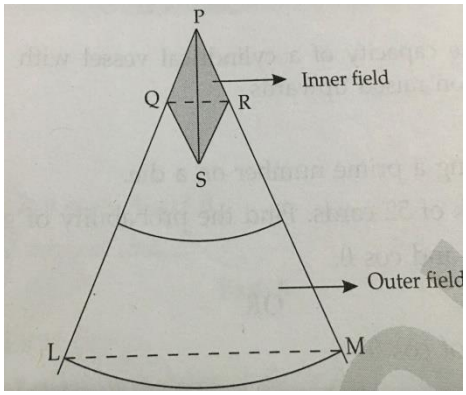
(a) 60 m (b) 60cm (c) 40 cm (d) 80cm

Q.30.If $\Delta ABC \sim \Delta PQR$, perimeter of ΔABC = 32cm,perimeter of ΔPQR = 48cm and PR = 6cm,then the length of AC is

(a) 9 cm (b) 4cm (c) 8cm (d) 18 cm

Case Study Questions (Triangles)

Q.1. a baseball coach is preparing a field for a game between two teams at the weekend. The field has two fences PL and PM .The field is in the shape of a triangle bounded by a semicircle. For the accuracy of the game, the dimensions of the field should be such that $\frac{PQ}{PL} = \frac{PR}{PM}$. Based on this situation, answer the following questions:



(i) The relation between the line segments QR and LM is

(a) QR || LM (b) QR = LM (c) QR = $\frac{1}{2}$ LM (d) QR = $\frac{1}{3}$ LM

(ii) The theorem applied in par (i) is

(a) Basic proportionality Theorem

(b) Pythagoras theorem

(c) Converse of Basic proportionality theorem

(d) Mid-point theorem

(iii) Which of the following relation is true for Δ PQR and Δ PLM?

(a) ar (Δ PQR) =ar(Δ PLM) (b) ar (Δ PQR) = $\frac{1}{2}$ ar(ΔPLM)

(c) Δ PQR ~ Δ PLM (d) Δ PQR$\cong$ ΔPLM

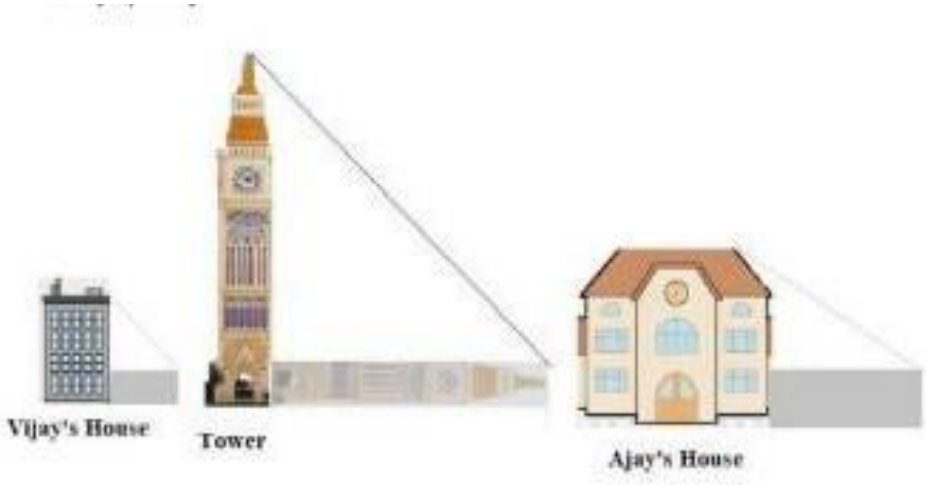
(iv) If PQ= 3 cm , QR = 4 cm and LM = 6 cm , then length of PL is

(a) 2 cm (b) 9 cm (c) 2.25 cm (d) 4.5 cm

(v) If $\angle P = 50^0$ and $\angle PLM = 60^0, then$ the measure of $\angle PRQ$ is

(a) 60^0 (b) 70^0 (c) 50^0 (d) 110^0

Q.2.



Vijay is trying to find the average height of a tower near his house. He is using the properties of similar triangles. The height of Vijay's house if 20m when Vijay's house casts a shadow 10m long on the ground. At the same time, the tower casts a shadow 50m long on the ground and the house of Ajay casts 20m shadow on the ground.

(i)What is the height of the tower?

(a)20m (b)50m (c)100m (d)200m

(ii) What will be the length of the shadow of the tower when vijay's house casts a shadow of 12m?

a) 75m

b) 60m

c) 45m

(iii)What is the height of Ajay's house?

a) 30m (b)40m (c) 50m (d)20m

(iv)When the tower casts a shadow of 40m, same time what will be the length of the shadow of Ajay's house?

a) 16m

b) 32m

c) 20m

d) 8m

(v)When the tower casts a shadow of 40m, same time what will be the length of the shadow of Vijay's house?

a) 15m

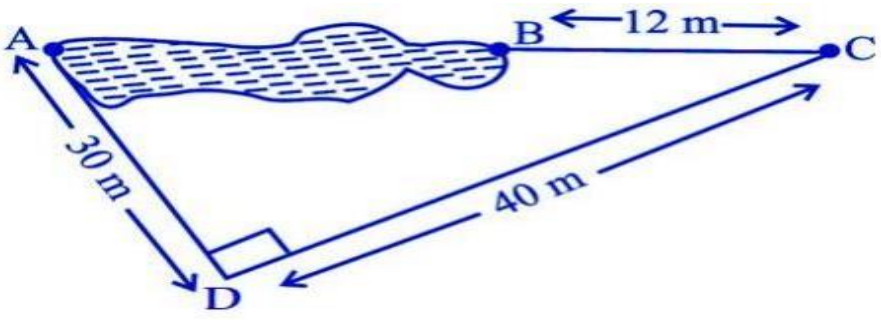
b) 32m

c) 16m

d) 8m

Q.3.

Rohan wants to measure the distance of a pond during the visit to his native.He marks points A and B on the opposite edges of a pond as shown in thefigure below. To find the distance between the points, he makes a right-angled triangle using rope connecting B with another point C are a distance of 12m, connecting C to point D at a distance of 40m from point C and the connecting D to the point A which is are a distance of 30m from D such the $\angle ADC=90^0$



(i)Which property of geometry will be used to find the distance AC?

a) Similarity of triangles

b) Thales Theorem

c) Pythagoras Theorem

d) Area of similar triangles

(ii) What is the distance AC?

a) 50m

b) 12m

c) 100m

d) 70m

(iii) Which is the following does not form a Pythagoras triplet?

a) (7, 24, 25) b) (15, 8, 17) c) (5, 12, 13) d) (21, 20, 28)

(iv) Find the length AB?

a) 12m b) 38m (c) 50m (d) 100m

(v) Find the length of the rope used.

a) 120m

b) 70m

c) 82m

d) 22m

Q.4. A scale drawing of an object is the same shape at the object but a different size. The scale of a drawing is a comparison of the length used on a drawing to the length it represents. The scale is written as a ratio. The ratio of two corresponding sides in similar figures is called the scale factor

Scale factor= length in image / corresponding length in object

If one shape can become another using revising, then the shapes are similar. Hence, two shapes are similar when one can become the other after a resize, flip, slide or turn.

In the photograph below showing the side view of a train engine. Scale factor is 1:200

This means that a length of 1 cm on the photograph above corresponds to a length of 200cm or 2 m, of the actual engine. The scale can also be written as the ratio of two lengths.

(i) If the length of the model is 11cm, then the overall length of the engine in the photograph above, including the couplings (mechanism used to connect) is:

a) 22cm

b) 220cm

c) 220m

d) 22m

(ii)What will affect the similarity of any two polygons?

a) They are flipped horizontally

b) They are dilated by a scale factor

c) They are translated down

d) They are not the mirror image of one another.

(iii) What is the actual width of the door if the width of the door in photograph is 0.35cm?

a) 0.7m

b) 0.7cm

c) 0.07cm

d) 0.07m

(iv) If two similar triangles have a scale factor 5:3 which statement regarding the two triangles is true?

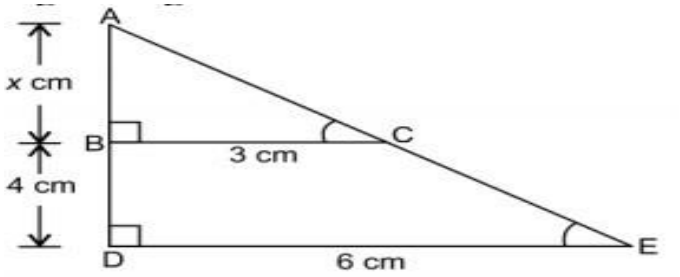
a) The ratio of their perimeters is 15:1

b) Their altitudes have a ratio 25:15

c) Their medians have a ratio 10:4

d) Their angle bisectors have a ratio 11:5

(v) The length of AB in the given figure:



(a)8cm (b)6cm (c)4cm (d)10cm

ASSERTION TYPE QUESTIONS (TRIANGLES)

Direction: In the following questions, a statement of assertion (A) is followed by a statement of reason (R).Mark the correct choice as:

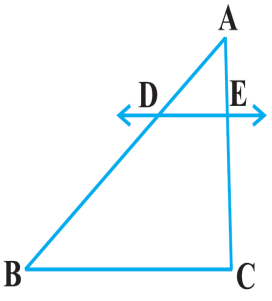
(a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).

(b) Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).

(c) Assertion (A) is true but reason (R) is false.

(d) Assertion (A) is false but reason (R) is true.

1. Assertion: D and E are points on the sides AB and AC respectively of Δ ABC such that DE $\parallel$ BC then the value of x is 4, when AD = x cm, DB = (x -2) cm, AE = (x+ 2) cm and EC = (x-1) cm.



Reason: If a line divides any two sides of a triangle in the same ratio then it is parallel to the third side.

(a) Both assertion (A) and reason (R) are true and reason(R) is the correct explanation of assertion (A).

(b) Both assertion (A) and reason (R) are true but reason(R) is not the correct explanation of assertion (A).

(c) Assertion (A) is true but reason (R) is false.

(d) Assertion (A) is false but reason (R) is true.

2. Assertion: D and E are points on the sides AB and AC of a ΔABC such that DE $\|$BC then the value of x is 11,when AD = 4 cm, DB = (x-4) cm, AE = 8 cm and EC = (3x -19) cm

Reason: If a line divides any two sides of a triangle in the same ratio then it is parallel to the third side.

(a) Both assertion (A) and reason (R) are true and reason(R) is the correct explanation of assertion (A).

(b) Both assertion (A) and reason (R) are true but reason(R) is not the correct explanation of assertion (A).

(c) Assertion (A) is true but reason (R) is false.

(d) Assertion (A) is false but reason (R) is true.

3. Assertion: D and E are points on the sides AB and AC respectively of a ΔABC such that AD = 5.7 cm, DB= 9.5 cm, AE = 4.8 cm and EC = 8 cm, then DE is not parallel to BC.

Reason: If a line divides any two sides of a triangle in the same ratio then it is parallel to the third side.

(a) Both assertion (A) and reason (R) are true and reason(R) is the correct explanation of assertion (A).

(b) Both assertion (A) and reason (R) are true but reason(R) is not the correct explanation of assertion (A).

(c) Assertion (A) is true but reason (R) is false.

(d) Assertion (A) is false but reason (R) is true.

4. Assertion: D and E are points on the sides AB and AC of a ΔABC such that AB = 10.8 cm, AD = 6.3 cm, AC = 9.6 cm and EC = 4cm then DE is parallel to BC.

Reason: If a line is drawn parallel to one side of a triangle then it divides the other two sides in the same ratio.

(a) Both assertion (A) and reason (R) are true and reason(R) is the correct explanation of assertion (A).

(b) Both assertion (A) and reason (R) are true but reason(R) is not the correct explanation of assertion (A).

(c) Assertion (A) is true but reason (R) is false.

(d) Assertion (A) is false but reason (R) is true.

5.Assertion: $\Delta ABC \sim \Delta DEF$ such that ar(ABC) = 16 cm^2 and ar(DEF) = 49 cm^2 .Then ,the ratio of their corresponding sides is 4 : 7.

Reason: The ratio of areas of two similar triangles is equal to the square of the ratio of their corresponding sides.

(a) Both assertion (A) and reason (R) are true and reason(R) is the correct explanation of assertion (A).
(b) Both assertion (A) and reason (R) are true but reason(R) is not the correct explanation of assertion (A).
(c) Assertion (A) is true but reason (R) is false.
(d) Assertion (A) is false but reason (R) is true.

6. Assertion: If a line intersects sides AB and AC of a ΔABC at D and E respectively and parallel to BC, then

$$\frac{AD}{DB} = \frac{AE}{AC}$$

Reason: If a line is parallel to one side of a triangle then it divides the other two sides in the same ratio.

(a) Both assertion (A) and reason (R) are true and reason(R) is the correct explanation of assertion (A).
(b) Both assertion (A) and reason (R) are true but reason(R) is not the correct explanation of assertion (A).
(c) Assertion (A) is true but reason (R) is false.
(d) Assertion (A) is false but reason (R) is true.

7. Assertion: In the ΔABC, AB = 24 cm, BC = 7cm and AC = 25 cm, then ΔABC is a right angle triangle.

Reason: If the square of one side is equal to the sum of squares of other two sides then the angle opposite to the largest side is right angle.

(a) Both assertion (A) and reason (R) are true and reason(R) is the correct explanation of assertion (A).
(b) Both assertion (A) and reason (R) are true but reason(R) is not the correct explanation of assertion (A).

(c) Assertion (A) is true but reason (R) is false.

(d) Assertion (A) is false but reason (R) is true.

8. Assertion: ABC is an isosceles triangle with AC = BC. If $AB^2 = 2AC^2$, then ΔABC is a right triangle.

Reason: If in a triangle, square of one side is equal to the sum of the squares of the other two sides, then the angle opposite the first side is a right angle.

(a) Both assertion (A) and reason (R) are true and reason(R) is the correct explanation of assertion (A).

(b) Both assertion (A) and reason (R) are true but reason(R) is not the correct explanation of assertion (A).

(c) Assertion (A) is true but reason (R) is false.

(d) Assertion (A) is false but reason (R) is true.

9. Assertion: Δ ABC is an isosceles triangle right angled at C then $AB^2 = 2AC^2$.

Reason: If in a triangle, square of one side is equal to the sum of the squares of the other two sides, then the angle opposite the first side is a right angle.

(a) Both assertion (A) and reason (R) are true and reason(R) is the correct explanation of assertion (A).

(b) Both assertion (A) and reason (R) are true but reason(R) is not the correct explanation of assertion (A).

(c) Assertion (A) is true but reason (R) is false.

(d) Assertion (A) is false but reason (R) is true.

10. Assertion: In ΔABC, AB = $6\sqrt{3}$ *cm*, AC = 12 cm and BC = 6 cm, then $\angle B = 90^0$.

Reason: If in a triangle, square of one side is equal to the sum of the squares of the other two sides, then the angle opposite the first side is a right angle.

(a) Both assertion (A) and reason (R) are true and reason(R) is the correct explanation of assertion (A).

(b) Both assertion (A) and reason (R) are true but reason(R) is not the correct explanation of assertion (A).

(c) Assertion (A) is true but reason (R) is false.

(d) Assertion (A) is false but reason (R) is true.

CHAPTER –COORDINATE GEOMETRY

MULTIPLE CHOICE QUESTIONS

1. The distance between the points A (0, 6) and B (0, –2) is

   (a) 6 (b) 3 (c) 4 (d) 8

2. The distance of the point P (2, 3) from the x-axis is

   (a) 2

   (b) 3

   (c) 1

   (d) 5

3. The distance of the point P (–6, 8) from the origin is

   (a) 8 (b) 27 (c) 10 (d) 6

4. If the distance between the points (2, –2) and (–1, x) is 5, one of the values of x is

   (a) –2 (b) 2 (c) –1 (d) 1

5. The mid-point of the line segment joining the points A (–2, 8) and B (– 6, – 4) is

   (a) (– 4, – 6)

   (b) (2, 6)

   (c) (– 4, 2)

   (d) (4, 2)

6. The distance between the points (0, 5) and (–5, 0) is

   (a) $5\sqrt{3}$ (b) $5\sqrt{2}$ (c) 25 (d) 50

7. The perimeter of a triangle with vertices (0, 4), (0, 0) and (3, 0) is

   (a) 12 (b) 2 (c) 11 (d) $7+\sqrt{5}$

8. The points (–4, 0), (4, 0), (0, 3) are the vertices of a

   (a) Right triangle (b) Isosceles triangle

   (c) Equilateral triangle (d) Scalene triangle

9. The point which divides the line segment joining the points (7, –6) and (3, 4) in ratio 1 : 2 internally lies in the

   (a) I quadrant (b) II quadrant (c) III quadrant (d) IV quadrant

10. If the distance between the points (4, p) and (1, 0) is 5, then the value of p is

    (a) 4 only (b) ± 4 (c) – 4 only (d) 0

11. If the point P$(k - 1, 2)$ is equidistant from the points A$(3, k)$ and B$(k, 5)$, find the values of k.

    (a) $k = 5$ (b) $k = 2, 5$ (c) $k = 1$ (d) $k = 1, 5$

12. Find the point on X-axis which is equidistant from the points (5, −2) and (−3, 2).

    (a) (1, 1) (b) (1, 0) (c) (2, 0) (d) (3, 0)

13. Find the coordinates of the point which divides the join of A(−1, 7) and B(4, − 3) in the ratio 2 : 3.

    (a) (1, 3) (b) (1, 0) (c) (0, 0) (d) (1, 1)

14. If $(2, p)$ is the midpoint of the line segment joining the points A(6, −5) and B(−2, 11), find the value of p.

    (a) 3 (b) 5 (c) 4 (d) 7

15. The lengths of the medians BE of a ΔABC whose vertices are A(0, − 1), B(2, 1) and C(0, 3).

    (a) 3 unit (b) 4 unit (c) 2 unit (d) 5 unit

16. If the points $P(a, -11)$, $Q(5, b), R(2, 15)$ and $S(1, 1)$ are the vertices of a parallelogram PQRS, find the values of a and b.

    (a) $a = 4 \,\&\, b = 5$ (b) $a = 4 \,\&\, b = 3$

    (c) $a = 5 \,\&\, b = 5$ (d) $a = 0 \,\&\, b = 5$

17. A line intersects the Y-axis and X-axis at the points P and Q respectively. If (2, –5) is the midpoint of PQ then find the coordinates of P and Q.

    (a) Q (4, 2) & P (0, - 10) (b) Q (4, 0) & P (10, - 10)

    (c) Q (4, 0) & P (0, 10) (d) Q (4, 0) & P (0, - 10)

18. Points A$(-1, y)$ and B(5, 7) lie on a circle with centre O$(2, -3y)$.Find the values of y.

    (a) – 1

    (b) -2

    (c) -3

    (d) 0

19. Find the ratio in which the point P $(x, 2)$ divides the join of A(12, 5) and B$(4, -3)$.

    (a) 4: 5 (b) 3: 5 (c) 1: 5 (d) 3: 4

20. If the points A (4, 3) and B$(x, 5)$ lie on the circle with centre O(2, 4), find the value of x.

    (a) 2 (b) 1 (c) 0 (d) -2

21. If the point C $(k, 4)$ divides the join of the points A (2, 6) and B (5, 1) in the ratio 2 : 3 then the value of k is

(a) $16/3$ (b)16/5 (c) 16/7 (d) 16/9

22. In what ratio does the X-axis divide the join of A (2, –3) and B (5, 6)?

(a) 2 : 3 (c) 1 : 2

(b) 3 : 5 (d) 2 : 1

23. In what ratio does the Y-axis divide the join of P (–4, 2) and Q(8, 3)?

(a) 3 : 1 (c) 2 : 1

(b) 1 : 3 (d) 1 : 2

24. Find a relation between x and y such that the point (x, y) is equidistant from the points (7, 1) and (3, 5).

(a) $x = y + 2$ (b) $x = -y + 2$

(c) $x = y - 2$ (d) $x = y + 22$

25. Find a point on the y-axis which is equidistant from the points A (6, 5) and B(– 4, 3).

(a) (0, 6) (b) (0, 9) (c) (5, 0) (d) (9, 0)

26. Distance between the pairs of points $(a, b), (-a, -b)$ is

(a) $2\sqrt{a^2 + b^2}$ (b) $\sqrt{a^2 + b^2}$

(c) $\sqrt{2a^2 + 2b^2}$ (d) 0

27. If Q (0, 1) is equidistant from P(5, –3) and R(x, 6), find the values of x.

(a) ± 4 (b) ± 41 (c) ±5 (d) 4

28. If $(1, 2), (4, y), (x, 6)$ and $(3, 5)$ are the vertices of a parallelogram taken in order, find x and y.

(a) $x = 5 \& y = 2$ (c) $x = 6 \& y = 3$

(b) $x = 2 \& y = 6$ (d) $x = 5 \& y = 5$

29. Find the coordinates of a point A, where AB is the diameter of a circle whose centre is (2, – 3) and B is (1, 4).

(a) (3, 10) (c) (3, - 10)

(b) (3, 12) (d) (10,10)

30. The area of a circle if centre of circle is (2,7) and a point on circumference is (4, -6) is

(a) 173π square unit (c) 113π square unit

(b) 1703π square unit (d) 13π square unit

ASSERTION AND REASON

DIRECTION:- In the following questions a statement of assertion (A) is followed by the statement of reason (R). mark the correct choice in the following questions

1. **Assertion**:-The point (0, 4) lie on $y-axis$.

   Reason:-The *x* co-ordinate on the point on $y\ -axis$ is zero.

   (a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).
   (b) Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).
   (c) Assertion (A) is true but reason (R) is false.
   (d) Assertion (A) is false but reason (R) is true.

2. **Assertion:-**The value of y is 6, for which the distance between the points $P\ (2,-3)$ and *Q (10, y)* is 10

   Reason:- Distance between two given points$A\ (x_1, y_1)$ *and* $B\ (x_2, y_2)$ is given 10,

   $$\text{AB} = \sqrt{(x_2-x_1)^2 + (y_2-y_1)^2}$$

   (a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).
   (b) Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).
   (c) Assertion (A) is true but reason (R) is false.
   (d) Assertion (A) is false but reason (R) is true.

3. **Assertion:-** The point on $x-\ axis\ (-7, 0)$ is equidistance from $(2.-5)$ and $(-2, 9)$.

   Reason:- Equal distance point on x- axis is find by using mid-point formula.

   (a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).
   (b) Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).
   (c) Assertion (A) is true but reason (R) is false.
   (d) Assertion (A) is false but reason (R) is true.

4. **Assertion:-**Perpendicular distance of $A\ (5, 12)$ from y-axis is 5.

   Reason:- Distance from y-axis is given by the value of abscissa in coordinate.

(a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).

(b) Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).

(c) Assertion (A) is true but reason (R) is false.

(d) Assertion (A) is false but reason (R) is true.

5. **Assertion**: Mid-point of a line segment divides line in the ratio $1:1$.

Reason : Distance of mid-point is unequal from both points.

(a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).

(b) Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).

(c) Assertion (A) is true but reason (R) is false.

(d) Assertion (A) is false but reason (R) is true.

6. **Assertion**:- The points $(1,7),(4,2),(-1,-1)\ and\ (-4,4)$ are the vertices of a square.

Reason:- in a square the length of four sides are equal and both diagonals are equal.

(a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).

(b) Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).

(c) Assertion (A) is true but reason (R) is false.

(d) Assertion (A) is false but reason (R) is true

7. **Assertion**:- The points A $(-2,1), B\ (1,0)$ and $C\ (4,-1)$ are collinear.

Reason:- Three points A B and C are collinear in same straight line, if $AB + BC = AC$

(a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).

(b) Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).

(c) Assertion (A) is true but reason (R) is false.

(d) Assertion (A) is false but reason (R) is true

8. **Assertion**:-The points $A(6,1), B(8,2), C(9,4)$ and $D(p,3)$ are the vertices of a parallelogram ABCD taken in order, if $p = 7$.

   Reason: - ABCD is a parallelogram if sides AB = CD and BC = AD.

   (a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).

   (b) Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).

   (c) Assertion (A) is true but reason (R) is false.

   (d) Assertion (A) is false but reason (R) is true

9. **Assertion**:- The area of a rhombus is 24 square unit, if its vertices are $(3,0)$, $(4,5)$ $(-1,4)$ and $(-2,-1)$ taken in order.

   Reason:- Area of a rhombus $= \frac{1}{2}$ (product of its diagonals)

   (a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).

   (b) Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).

   (c) Assertion (A) is true but reason (R) is false.

   (d) Assertion (A) is false but reason (R) is true

10. **Assertion**:- The coordinates $(1,3)$ which divides the join of $(-1,7)$ and $(4,-3)$ in the ratio 2 : 3.

    Reason:- Three points A, B and C are collinear in same straight line, if $AB + BC = AC$.

    (a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).

    (b) Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).

    (c) Assertion (A) is true but reason (R) is false.

    (d) Assertion (A) is false but reason (R) is true

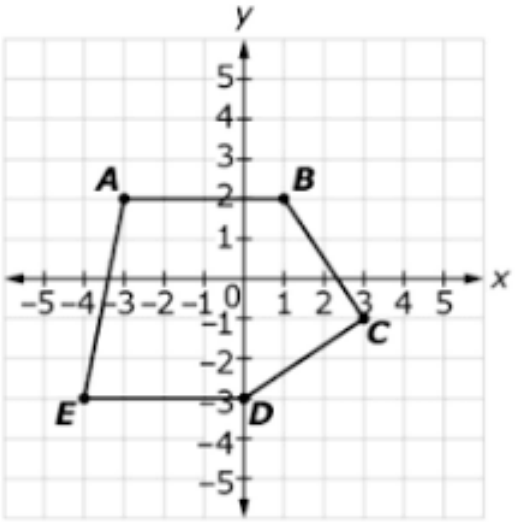
Case study questions

THEME-1 (School visit)

Ashok is a student of class IX. He is doing a project work that Vidyalaya road maps. So Ashok visit in the Vidyalaya and observe some part of the Vidyalaya and draw a

road map on a graph paper. He takes principal office on the origin of his graph and then give others locations. Observe the graph and give the answer of the following ~~questions~~.

A-sport room, B-maths lab, C-chemistry lab, D- library and E- staff room.



1. Coordinate of sport room is
   (a) (3, - 4) (c) (- 3, 2)
   (b) (-4, - 3) (d) (3, 3)

2. Distance between staff room office to library is
   (a) 3 unit (c) 8 unit
   (b) 5 unit (d) 4 unit

3. If we draw a straight-line staff room to chemistry lab (EC) is cut Y-axis. Then what ratio EC is divided by Y-axis.
   (a) 3 : 4 (c) 4 : 3
   (b) 3 : 1 (d) 3 : 1

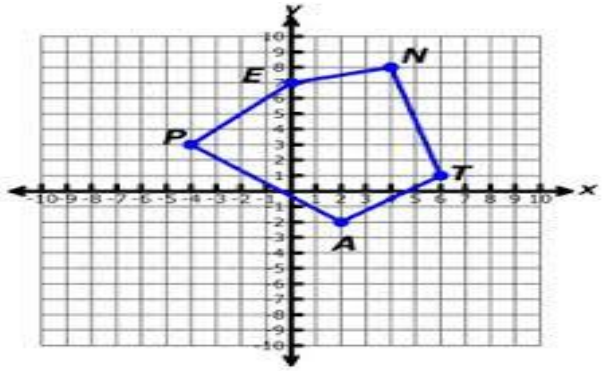
4. According to the graph chemistry lab is present in
   (a) I Quadrant (c) III Quadrant
   (b) II Quadrant (d) IV Quadrant
5. Straight distance between staff room to maths lab is
   (a) $5\sqrt{3}$ (b) $5\sqrt{2}$

(c) 25 (d) 50

THEME-2 (Travelling)

Ayush starts walking from his house to office. Instead of going to the office directly, he goes to a bank first, from there to his daughter's school and then reaches the office. And in evening he also first go to Aadhar centre for own Aadhar card correction.

A- Ayush House , T-Bank, N- Daughter's school, E- Ayush's Office & P- Aadhar Centre.



1. Observe the map given coordinate of his daughter's school is
   (a) (3, 8) (c) (-4, 3)
   (b) (4, 8) (d) (2, -2)
2. If Ayush want to go his office directly from his house distance travel by Ayush is
   (a) $\sqrt{85}$ unit (c) 8 unit
   (b) $\sqrt{81}$ unit (d) $\sqrt{218}$ unit
3. When he returns Aadhar centre to his home his house as PA he crosses the X-axis. The ration X-axis divide PA is
   (a) 4: 5 (c) 2: 5
   (b) 2: 3 (d) 1: 5
4. According to the graph a Park is at the mid-point of the AN then the coordinates of Park is
   (a) (1, 5) (c) (3, -3)
   (b) (-1, 5) (d) (3, 3)
5. Distance between Aadhar Centre to Ayush house is

(a) $\sqrt{61}$ uint

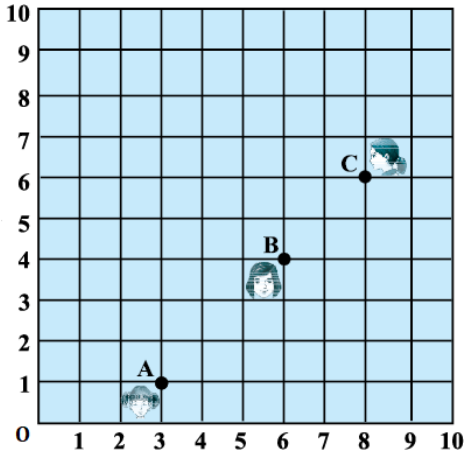
(b) $\sqrt{29}$ unit

(c) 25 unit

(d) 61 unit

THEME-3 (Covid-19 vaccination)

Mr. Jaskirat Singh is living in Jalandhar Punjab. As per the government he takes his dose of vaccine in the months of June 2021 in the Civil Hospital Jalandhar. Now He want to take his second dose. The following map is showing three vaccination centers near his home. O represents his home. Observe this condition and answer the following questions.Vaccination center A, B & C.



1. The coordinates of nearest vaccination center.

   (a) (3, 1)

   (b) (4, 2)

   (c) (0, 4)

   (d) (7, 4)

2. According to the figure vaccination center B is divide the line joining vaccination center A to C

   (a) 2 :3

   (b) 3:1

   (c) 3: 2

   (d) 1 :1

3. Distance between center A to C

   (a) $4\sqrt{2}$

   (b) $5\sqrt{2}$

   (c) $41\sqrt{2}$

   (d) 50

4. Assuming he went to center B and doses are finished. Then what is the closest distance he has to cover to reach another Vaccination center.

   (a) $4\sqrt{2}$

   (b) $\sqrt{2}$

   (c) $2\sqrt{2}$

   (d) $6\sqrt{2}$

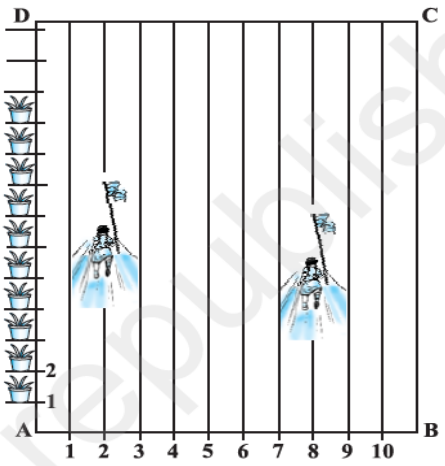
5. Straight distance between his home to Vaccination center C is

(a) 11 (c) 13

(b) 12 (d) 10

THEME-4 (Sports Day)

In order to conduct Sports Day activities in your School, lines have been drawn with chalk powder at a distance of 1 m each, in a rectangular shaped ground ABCD, 100 flowerpots have been placed at a distance of 1 m from each other along AD, as shown in given figure below. Niharika runs 1/4th the distance AD on the 2nd line and posts a green flag. Preet runs 1/5th distance AD on the eighth line and posts a red flag.



1. Find the position of green flag

   (a) (2,25) (c) (25, 2)

   (b) (2, 0.25) (d) (0, -25)

2. Find the position of red flag

   (a) (8,0) (c) (8, 20)

   (b) (20, 8) (d) (8, 0.2)

3. What is the distance between both the flags?

   (a) $\sqrt{41}$ (c) $\sqrt{61}$

   (b) $\sqrt{11}$ (d) $\sqrt{51}$

4. If Rashmi has to post a blue flag exactly halfway between the line segment joining the two flags, where should she post her flag?

   (a) (5, 22.5) (c) (2, 8.5)

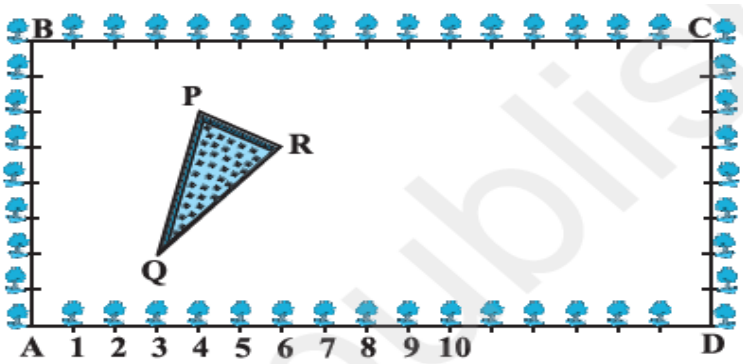
   (b) (10,22) (d) (2.5, 20)

5. If Joy has to post a flag in ratio 1:2 between line segment joining the green and red flags, then in which row he posts the flag

(a) Fourth row
(b) Fifth row
(c) Sixth row
(d) None of these

THEME-5 (Gardening)

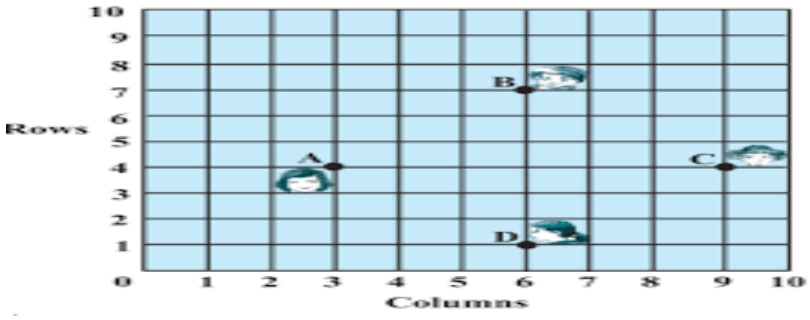
The class X students' school in Krishnagar have been allotted a rectangular plot of land for their gardening activity. Saplings of Gulmohar are planted on the boundary at a distance of 1 m from each other. There is triangular grassy lawn in the plot as shown in the figure. The students are to sow seeds of flowering plants on the remaining area of the plot.



1. Taking A as origin, find the coordinates of P
   (a) (4, 6)
   (b) (6, 4)
   (c) (0, 6)
   (d) (4, 0)
2. What will be the coordinates of mid-point of side QR if A is the origin?
   (a) (8, 6)
   (b) (9/2, 7/2)
   (c) (7/2, 3)
   (d) (7/2, 9/2)
3. Mid-point of PR, if A is the origin?
   (a) (5, 11/2)
   (b) (-6, 13)
   (c) (-13, 6)
   (d) (13, 6)
4. Length of side PQ if A is origin is
   (a) $\sqrt{24}$
   (b) $\sqrt{17}$
   (c) $\sqrt{62}$
   (d) 25
5. The length of side QR as A is origin is
   (a) 8
   (b) $3\sqrt{2}$
   (c) $2\sqrt{3}$
   (d) 4.5

THEME-6 (Class room seating)

In a classroom, 4 friends are seated at the points A, B, C and D as shown in figure they start to play a running game in the class room, Amita runs toward Bhoomika and Chameli runs toward Amita and then Bhoomika toward to Deepika. During this game they all four friends get an idea that they think their way of running and set some mathematical problems.



1. In which of the following coordinates is addressing the position of A.
   (a) (3, 4) (c) (9, 4)
   (b) (6, 1) (d) (6, 7)
2. Distance of a side AB of this quadrilateral is
   (a) $3\sqrt{2}$ (c) $2\sqrt{3}$
   (b) $3\sqrt{3}$ (d) $\sqrt{2}$
3. Mid-point of diagonal BD is
   (a) (1, 5) (c) (5, 5)
   (b) (6, 4) (d) (8, 9)
4. Length of diagonal AC is
   (a) 6 unit (c) 8unit
   (b) 7 unit (d) 9 unit
5. If ABCD is a square then the area is
   (a) 12 square unit (c) 18 square unit
   (b) 10 square unit (d) 36 square unit

CHAPTER –INTRODUCTION TO TRIGONOMETRY

1. The value of (Sin 30 ° + Cos 30°) – (Sin 60° + Cos 60 °) is

$(a)\ -1\quad (b)\ 0\quad (c)\ 1\quad (d)\ 2$

2. The value of (sin 45°+ cos 45°) is

(a) $1/\sqrt{2}$ (b) $\sqrt{2}$ (c) $\sqrt{3}/2$ (d) 1

3. The value of tan 30°/ cot 60° is

(a) $1/\sqrt{2}$ (b) $1/\sqrt{3}$ (c) $\sqrt{3}$ (d) 1

4. If cos A= 4/5, then the value of tan A is

(a) 3/5 (b) 3/4 (c) 4/3 (d) 5/3

5. If sin A=1/2 then the value of cot A is

(a) $\sqrt{3}$ (b) $1/\sqrt{3}$ (c) $\sqrt{3}/2$ (d) 1

6 .If ▲ABC is right angled at C , then the value of cos (A+B) is

(a) 0 (b) 1 (c) 1/2 (d) $\sqrt{3}/2$

7. Given that $\sin\alpha = 1/2$ and $\cos\beta = 1/2$,then the value of $(\alpha + \beta)$ is

(a) 0° (b) 30° (c) 60° (d) 90°

8 .If tanA=5/12 , find the value of(sin A +cosA) secA

(a) 17/12 (b) 15/12 (c) 5/12 (d) 19/12

9. If cosA= 7/ 25 , find the value of tanA + cot A .

(a) 62/168 (b) 112/168 (c) 1 (d) 625/168

10. If $\sqrt{3}\tan\beta = 3\sin\beta$, find the value of $\sin^2\beta - \cos^2\beta$.

(a) 1 (b) 1/3 (c) 2/3 (d) 2

11 In ▲ABC, right angled at B, AB=24 cm, BC =7 cm, find the value of sinA .

(a) 17/25 (b)24/25 (c) 7/25 (d) 12/25

12. Given 15 cotA = 8, find sec A.

(a)1/4 (b) 9/4 (c) 17/8 (d) 25/8

13. If cos (40° + x) = sin 30°, find the value of x.

(a) 20° (b) 40 ° (c) 25° (d) 50°

14. If tan (A + B) =√3 and tan (A-B) = 1/√3,find A and B.

(a) 15°,30° (b) 45 °,15° (c)30°,45° (d) 30° ,30°

15 .If sin 2A = 2sinA is true when A =

(a) 0° (b) 30° (c) 45° (d) 60°

16. The maximum value of sinβ is

(a) 1/2 (b) √3/2 (c) 1 (d)1/√2

17. The maximum value of 1/secα, $0° \leq \alpha < 90°$ is :

(a) 1 (b) 2 (c) 1/2 (d)1/√2

18 . If in ▲ ABC, <B=90°, AB=12 cm and BC= 5 cm, then the value of cot C is

(a) 13/5 (b) 5/12 (c) 12/5 (d) 5/13

19. Find $9 \sec^2 A - 9 \tan^2 A$ =

(a) 1 (b) 9 (c) 8 (d) 0

20. Find (secA + tanA) (1- sinA) =

(a) secA (b) sin A (c) cosec A (d) cos A

21. Find the value of secA(1 –sin A)(secA+ tanA) .

(a) -1 (b) 1 (c) 2 (d) -2

22. If tan α =cot α, then the value of sec α is :

(a) 2 (b) 1 (c) 1/√3 (d) √2

23.If tanα =√3 and tanβ = 1/√3 ,find the value of cot (α +β) is :

(a) √3 (b) 0 (c) 1/√3 (d) 1

24. The value of $(11/\cot^2\beta - 11/\cos^2\beta)$ is :

(a) 11 (b) 0 (c) 1/11 (d) -11

25. The value of $\tan^2\beta$ ($\operatorname{cosec}^2\beta$ - 1) is

(a) tan 2β (b)cosec2β (c)cot2β (d) 1

26. The value of

$(1 + \cot^2\alpha)(1 + \cos\alpha)(1 - \cos\alpha)$ is

(a) $\sin^2\alpha$ (b) $\operatorname{cosec}^2\alpha$ (c) 1 (d) $\sec^2\alpha$

27.$(\operatorname{cosec}^2\beta - \cot^2\beta)(1 - \cos^2\beta)$ is equal to

(a) Cosec β (b) tan β (c) $\sec^2\beta$ (d)$\sin^2\beta$

28 . . If $\sin\alpha=1/2$, then the value of $(\tan\alpha + \cot\alpha)^2$ is

(a)16/3 (b) 8/3 (c) 4/3 (d)10/3

29. If $\operatorname{cosec}\alpha - \cot\alpha = 1/4$,then the value of $\operatorname{cosec}\alpha + \cot\alpha$ is :

(a) 4 (b) 1/4 (c) 1 (d) -1

30.If $\tan\beta + \cot\beta = 5$, then find the value of $\tan^2\beta + \cot^2\beta$ is :

(a) 23 (b) 25 (c) 27 (d) 15

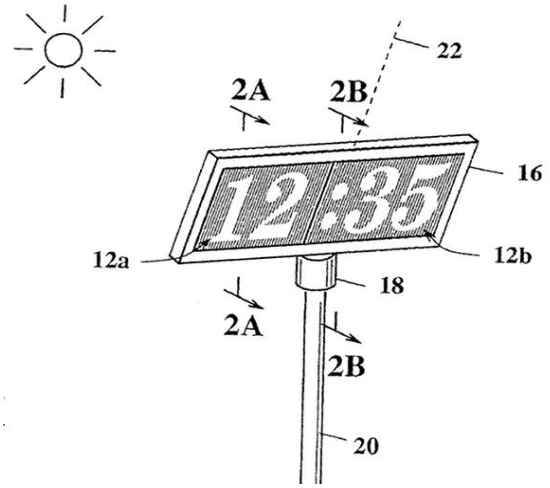
CASE STUDY 1 :

Sundial

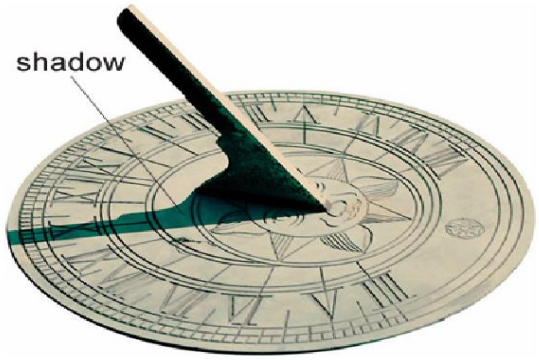
There is no Sunrise or Sunset at the polar regions as we experience at lower latitudes. The Sun appears above the horizon in Summer and makes a 360° circle in the sky - over a period of 187 days at the North Pole 90° North latitude. And in winter, the Sun is below the horizon for 163 days of darkness. It's not exactly six months of darkness/sunlight at the poles.

A sundial is a device that tells the time of day when there is sunlight by the apparent position of the Sun in the sky. It consists of a flat plate and a gnomon (vertical stick) which casts a shadow onto the dial. To setup a sundial at any place on the earth, inclination of its gnomon is decided by respective latitude but on the pole a simple vertical stick serves the purpose. At

poles in summer sun makes a 360° circle in the sky in every 24 hours so gnomon's shadow makes one complete circle on its dial. Now a day's digital sundials are also available which shows time in digits using sunlight. Pictures of classical sundial and digital sundial are given below.



Digital sundial



Classical sundial

Q 1: A sundial is placed at the north pole during summer , what shape will gnomon's shadow complete in 24 hours ?

a) Ellipse
b) Circle
c) Straight line
d) There is no change in its direction.

Q. 2) At north pole, what will be the angle of rotation of shadow in one hour ?

(a) 16° (b) 15° (c) 12° (d) 30°

Q3. At north pole, how much time is required for the angle of rotation to be 180° ?

(a) 24 hrs (b) 18 hrs (c) 12 hrs (d) 15 hrs

Q4. What will be the angle of rotation in 9 hours ?

(a) 125 (b) 135° (c) 140° (d) 120°

Q5. If the time is 9:00 hrs when angle of rotation is 135°, what will be the time when angle of rotation is 180° .

(a) 12 hrs (b) 10 hrs (c) 15 hrs (d) 19 hrs

CASE STUDY 2:

A group of students of class X visited India Gate on an education trip. The teacher and students had interest in history as well. The teacher narrated that India Gate, official name Delhi Memorial, originally called All-India War Memorial, monumental sandstone arch in New Delhi, dedicated to the troops of British India who died in wars fought between 1914 and 1919. The teacher also said that India Gate, which is located at the eastern end of the Rajpath (formerly called the Kingsway), is about 138 feet (42 metres) in height.

1. What is the angle of elevation if they are standing at a distance of 42m away from the monument?

a) 30^o c) 60^o

b) 45^o d) 0^o

2. They want to see the tower at an angle of 60^o. So, they want to know the distance where they should stand and hence find the distance.

a) 24.24 m c) 42 m

b) 20.12 m d) 24.64 m

3. If the altitude of the Sun is at 60^o, then the height of the vertical tower that will cast a shadow of length 20 m is

a) $20\sqrt{3}$ m c) $15/\sqrt{3}$ m

b) $20/\sqrt{3}$ m d) $15\sqrt{3}$ m

4. The ratio of the length of a rod and its shadow is 1:1. The angle of elevation of the Sun is

a) 30^o c) 60^o

b) 45^o d) 90^o

5. The angle formed by the line of sight with the horizontal when the object viewed is below the horizontal level is

a) corresponding angle c) angle of depression

b) angle of elevation d) complete angle

ASSERTION AND REASON TYPE QUESTIONS

Q.1 Assertion : cos A is the product of cos and A.

Reason : The value of cosθ decrease as θ increase.

(a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).

(b) Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).

(c) Assertion (A) is true but reason (R) is false.

(d) Assertion (A) is false but reason (R) is true.

Q.2 Assertion: If $\sin\theta + \sin^2\theta = 1$,prove that $\cos^2\theta + \cos^4\theta = 1$

Reason : The value of sinθ increase as θ increase .

(a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).

(b) Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).

(c) Assertion (A) is true but reason (R) is false.

(d) Assertion (A) is false but reason (R) is true.

Q.3 Assertion : $\sin(A + B) = \sin A + \sin B$

Reason : for any value of θ, $1 + \tan^2\theta = \sec^2\theta$

(a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).

(b) Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).

(c) Assertion (A) is true but reason (R) is false.

(d) Assertion (A) is false but reason (R) is true.

Q .4 Assertion : The value of $\sin 30°\cos 60° + \sin 60°\cos 30°$ is 1

Reason : $\sin 90° = 1, \cos 90° = 0$

(a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).

(b) Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).

(c) Assertion (A) is true but reason (R) is false.

(d) Assertion (A) is false but reason (R) is true.

Q.5 Assertion : The value of $2 \tan^2 45° + \cos^2 30° - \sin^2 60°$ is 2

Reason : value of $\tan 45° = 1, \cos 30° = \sqrt{3}/2$, $\sin 60° = \sqrt{3}/2$

(a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).

(b) Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).

(c) Assertion (A) is true but reason (R) is false.

(d) Assertion (A) is false but reason (R) is true.

Q.6 Assertion : $\sin\theta = \cos\theta$ for all values of

Reason : The value of $\cos\theta$ decrease as θ increase .

(a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).

(b) Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).

(c) Assertion (A) is true but reason (R) is false.

(d) Assertion (A) is false but reason (R) is true.

Q.7 Assertion : The value of $\sec A (1 - \sin A) (\sec A + \tan A)$ is 1

Reason : $1 + \tan^2 A = \sec^2 A$ for any value of A .

(a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).

(b) Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).

(c) Assertion (A) is true but reason (R) is false.

(d) Assertion (A) is false but reason (R) is true.

Q.8 Assertion : sin A is the product of sin and A .

Reason : The value of sinθ increases as θ increases .

(a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).

(b) Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).

(c) Assertion (A) is true but reason (R) is false.

(d) Assertion (A) is false but reason (R) is true.

Q.9 Assertion : If tanθ = cotθ , then the value of sec θ is √2 .

Reason : sinθ increases as θ increases.

(a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).

(b) Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).

(c) Assertion (A) is true but reason (R) is false.

(d) Assertion (A) is false but reason (R) is true.

Q 10. Assertion: In a right triangle ABC, right angled at B, cot A =8/15, then cosec A = 17/15.

Reason : cot A is the product of cot and A .

(a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).

(b) Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).

(c) Assertion (A) is true but reason (R) is false.

(d) Assertion (A) is false but reason (R) is true.

CHAPTER –AREA RELATED TO CIRCLES

1. Let h be the **height** and **a** be the **side** of an equilateral triangle, then $h = (\sqrt{3}/2)a$.
2. **Circumference and area of a circle.**

   If r is the **radius** of a circle, then

   (i) the circumference of the circle = $2\pi r$

   (ii) the area of the circle = πr^2
3. **Area of a circular ring.**

   If R and r are the radii of the bigger and smaller (concentric) circles, then

   area of the ring = $\pi(R^2 - r^2)$.
4. **Circumference and area of a sector of a circle.**

   If r is the radius of the circle and the arc subtends an angle of n° at the center, then

   (i) the length of the arc = $(n/360).2\pi r = n\pi r/180$

   (ii) the area of the sector = $(n/360).\pi r^2$
5. **Circumference and area of circumscribed and inscribed circles of an equilateral triangle.**

   If R and r are the radii of the circumscribed and inscribed circles of the triangle, then

   (i) $R = (2/3)h$ and $r = (1/3)h$

   (ii) the circumference of the circumscribed circle = $2\pi R = (4/3)\pi h$

   (iii) the area of the circumscribed circle = $\pi R^2 = (4/9)\pi h^2$

   (iv) the circumference of the inscribed circle = $2\pi r = (2/3)\pi h$

   (v) the area of the inscribed circle = $\pi r^2 = (1/9)\pi h^2$
6. **Circumference and area of circumscribed and inscribed circles of a regular hexagon.**

Let a be the side of a regular hexagon and R, r be the radii of the circumscribed and inscribed circles respectively of the hexagon, then

(i) $R = a$ and $r = (\sqrt{3}/2)\,a$

(ii) the circumference of the circumscribed circle = $2\pi R = 2\pi a$

(iii) the area of the circumscribed circle = $\pi R^2 = \pi a^2$

(iv) the circumference of the inscribed circle = $2\pi r = \sqrt{3}\,\pi a$

(iv) the area of the inscribed circle = $\pi r^2 = (3/4)\pi a^2$.

MCQ

(Note: Use $\Pi = \frac{22}{7}$ if not mention in question)

1. The area of the sector of a circle of radius r and central angle θ, is

A) $\frac{\Pi r}{2}$ B) $\frac{2\Pi r^2\theta}{720^o}$ C) $\frac{2\Pi r\theta}{360^o}$ D) $\frac{\Pi r\theta}{360^o}$

2. An arc of a circle is of length 5π cm and the sector it bounds has an area of 20 πcm^2. The radius of circle is

A) 1cm B) 5cm C) 8cm D) 10cm

3. A sector is cut from a circle of radius 21 cm. The angle of sector is 60°. The area of sector is

(A) 577.5 cm^2 (B) 231 m^2 (C) 152 m^2 (D) 231 cm^2

4. A chord AB of a circle of radius 10 cm makes a right angle at the centre of the circle. The area of major segment is

(A) 210 cm^2 (B) 285.5 cm^2 (C) 285.7 cm^2 (D) 258.1 cm^2

5. A horse is tied to a pole with 56 m long string. The area of the field where the horse can graze is

(A) 2560 m^2 (B) 2464 m^2 (C) 9856 m^2 (D) 25600 m^2

6. The circumferences of two circles are in the ratio 2:3. The ratio of their areas is

(A) 4:9 (B) 2:3 (C) 7:9 (D) 4:10

7. Area enclosed between two concentric circles is 770 cm^2. If the radius of outer circle is 21cm, then the radius of inner circle is

(A) 12 cm (B) 13 cm (C) 14 cm (D) 15 cm

8. The perimeter of a semi-circular protector is 72 cm. Its diameter is

(A) 14 cm (B) 28 cm (C) 36 cm (D) 24 cm

9. The minute hand of a clock is 7 cm long. The area described by it on the face of clock in 10 minutes is

(A) 115.5 cm^2 (B) 112.5 cm^2 (C) 25.7 cm^2 (D) 123.5 cm^2

10. The area of a circle circumscribing a square of area 64 cm^2 is

(A) 50.28 cm^2 (B) 25.5 cm^2 (C) 100.48 cm^2 (D) 75.48 cm^2

11. The length of an arc of a circle of radius r subtending angle θ at the centre is ;

(A) $\frac{\Pi r\theta}{360^o}$ (B) $\frac{4\Pi r\theta}{360^o}$ (C) $\frac{2\Pi r\theta}{720^o}$ (D) $\frac{2\Pi r\theta}{360^o}$

12. Area of a sector of angle 'k' (in degrees) of a circle with radius R is

(A) $\frac{k}{360^o}2\Pi R$ (B) $\frac{k}{180^o}\Pi R^2$ (C) $\frac{k}{720^o}2\Pi R^2$ (D) $\frac{k}{360^o}2\Pi R^2$

13. The perimeter of sector of a circle of radius r and central angle θ is -----.

(A) $\frac{\theta}{360^o}2\Pi r$ (B) $\frac{\theta}{360^o}2\Pi r + 2r$ C) $\frac{\theta}{360^o}2\Pi r^2$ (D) $\frac{\theta}{180^o}2\Pi r^2 + 2r$

14. The areas of two circular fields are in the ratio of 16:49. If the radius of the bigger circle is 14 cm, then the radius of smaller circle is _____.

(A) 8 cm (B) 14 cm (C) 16 cm (D) 24 cm

15. The distance travelled by a road roller of radius r and length L in 20 rotations is...

(A) $2\Pi rL$ (B) $20\Pi rL$ (C) $40\Pi rL$ (D) $2\Pi r^2 L$

16. If the sum of the areas of two circles with radii R_1 and R_2 is equal to the area of a circle of radius R, then

(A) $R_1 + R_2 = R$ (B) $R_1^2 + R_2^2 = R^2$ (C) $R_1 + R_2 < R$ (D) $R_1^2 + R_2^2 < R^2$

17. If a road roller, of radius 7 cm and length 20 cm performs 20 revolutions in a minute then the distance traveled by it in one minute is ___.

(A) 880 cm (B) 1760 cm (C) 17600 cm (D) 1600 cm

18. Which of these is equivalent to π?

(A) $\frac{Circumference}{radius}$ (B) $\frac{Circumference}{diameter}$ (C) Circumference × diameter

(D) Circumference × radius

19. Raman draws a circle with diameter 6 units. He draws another circle by increasing the radius of the previously drawn circle by 4 units. What would be the quotient if he divides the circumference of newly formed circle by its diameter?

(A) π (B) 2π (C) 8 (D) 12

20. A circular garden, of circumference 88 m is surrounded by a pathway of width 3.5 m. Ajay wants to put fence around the pathway. What is the cost of fencing the pathway at the rate of Rs70 per metre?

A) Rs; 3,080 (B) Rs: 3,850 (C) Rs: 7,700 (D) Rs: 6,160

21. To form a circle of radius r, four minor sectors of equal measure are joined.

Which of these options completes the sentence below?

The sum of the area of the four minor sectors is equal to the _.

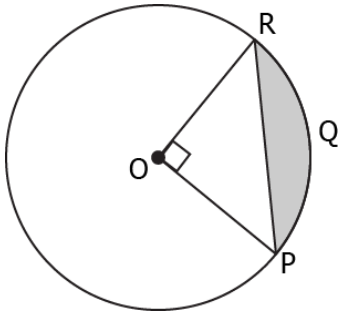
A) circumference of the circle of radius r. B) area of the semicircle of diameter 2r.

C) area of the circle of diameter 2r. D) circumference of the circle of diameter r.

22. Which of these is equivalent to the sum of the lengths of arc corresponding to the minor and major segment of a circle of radius 12 cm?

A) 12π cm (B) 24π cm (C) 36π cm (D) 144π cm

23. Observe the following figure

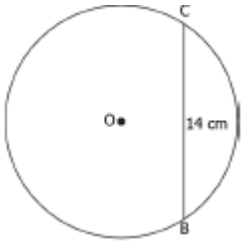


.

What is the area of the segment PQR, if the radius of the circle is 7 cm?

A) $11cm^2$ (B) $14\ cm^2$ (C) $17.3\ cm^2$ (D) $91\ cm^2$

24. A circle with centre O of diameter 28 cm and a chord BC of length 14 cm is shown below:



What is the length of the major arc of the circle, to the nearest tenth?

A) 7.3 cm (B) 14.7 cm (C) 73.3 cm (D) 146.7 cm

25. In equilateral triangle of side 28 cm is inscribed in a circle of diameter 32 cm, as shown below:

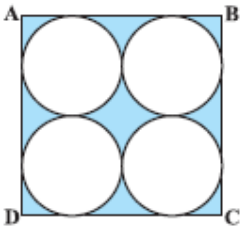
What is the area of the shaded region? (Use π = 3.14 and $\sqrt{3}$=1.73)

A) 125.68 cm^2 (B) 464.76 cm^2 (C) 411.84 cm^2, (D) 2876.28 cm^2

26. Tick the correct answer in the following and justify your choice: If the perimeter and the area of a circle are numerically equal, then the radius of the circle is

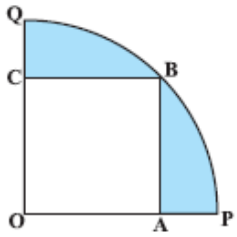
(A) 2 units (B) π units (C) 4 units (D) 7 units

27. Find the area of the shaded region in Fig., where ABCD is a square of side 14 cm.



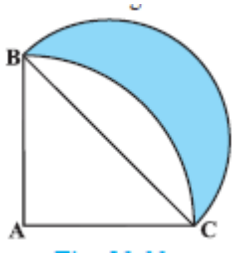
A) 196 cm^2 (B) 14 cm^2 (C) 42 cm^2 , (D) 91 cm^2

28. In Fig., a square OABC is inscribed in a quadrant OPBQ. If OA = 20 cm, find the area of the shaded region. (Use π = 3.14)



A) 196 cm^2 (B) 428 cm^2 (C) 412 cm^2 , (D) 228 cm^2

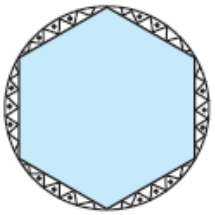
29. In Fig., ABC is a quadrant of a circle of radius 14 cm and a semicircle is drawn with BC as diameter. Find the area of the shaded region.



A) 98 cm^2 (B) 94 cm^2 (C) 88 cm^2 , (D) 91 cm^2

30. A round table cover has six equal designs as shown in Fig. If the radius of the cover is 28 cm,

find the cost of making the designs at the rate of Rs 0.35 per cm^2. (Use 3 = 1.7)



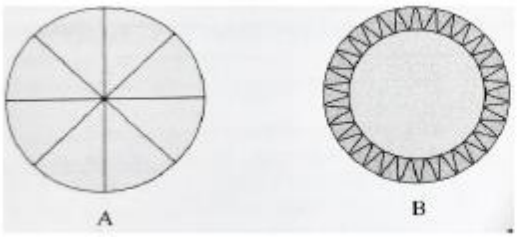
A) 196 cm^2 (B) 162.68 cm^2 (C) 464.8 cm^2 , (D) 262 cm^2

A Brooch

CASE STUDY 1:

A brooch is a small piece of jewelry which has a pin at the back so it can be fastened on a dress, blouse or coat.

Designs of some brooch are shown below. Observe them carefully.



Design A: Brooch A is made with silver wire in the form of a circle with diameter 28mm. The wire used for making 4 diameters which divide the circle into 8 equal parts.

Design B: Brooch b is made two colors. Gold and silver. Outer part is made with Gold. The circumference of silver part is 44mm and the gold part is 3mm wide everywhere.

Refer to Design A

1. The total length of silver wire required is

a) 180 mm b) 200 mm c) 250 mm d) 280 mm

2. The area of each sector of the brooch is

a) 44 mm^2 b) 52 mm^2 c) 77 mm^2 d) 68 mm^2

Refer to Design B

3. The circumference of outer part (golden) is

a) 48.49 mm b) 82.2 mm c) 72.50 mm d) 62.86 mm

4. The difference of areas of golden and silver parts is

a) 18 π b) 44 π c) 51 π d) 64 π

5. A boy is playing with brooch B. He makes revolution with it along its edge. How many complete revolutions must it take to cover 80∏ mm?

a) 2 b) 3 c) 4 d) 5

AREAS RELATED TO CIRCLES

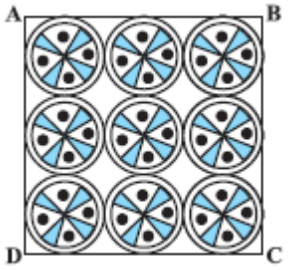
CASE STUDY 2:

Pookalam is the flower bed or flower pattern designed during Onam in Kerala. It is similar as Rangoli in North India and Kolam in Tamil Nadu.

During the festival of Onam , your school is planning to conduct a Pookalam competition.

Your friend who is a partner in competition , suggests two designs given below.

Observe these carefully.



Design I: This design is made with a circle of radius 32cm leaving equilateral triangle ABC in the middle as shown in the given figure.

Design II: This Pookalam is made with 9 circular design each of radius 7cm.

Refer Design I:

1. The side of equilateral triangle is

a) 12√3 cm b) 32√3 cm c) 48cm d) 64cm

2. The altitude of the equilateral triangle is

a) 8 cmb) 12 cm c) 48cm d) 52cm

Refer Design II:

3. The area of square is

a) 1264 cm^2 b) 1764 cm^2 c) 1830 cm^2 d) 1944 cm^2

4. Area of each circular design is

a) 124 cm^2 b) 132 cm^2 c) 144 cm^2 d) 154 cm^2

5. Area of the remaining portion of the square ABCD is

a) 378 cm^2 b) 260 cm^2 c) 340 cm^2 d) 278 cm^2

ASSERSATION AND RESONING

DIRECTION: In The following questions the statement of assertion (A) is followed by a statement of reason (R). Mark the correct choice as:

a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).

b) Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).

c) Assertion (A) is true but reasons (R) is false.

d) Assertion (A) is false but reasons (R) is true.

Q1. Assertion: In a circle of radius 6 cm, the angle of a sector 60°. Then the area of the sector is $18\frac{6}{7}$ cm^2.

Reason: Area of the circle with radius r is πr^2.

Q2. Assertion: If the circumference of a circle is 176 cm, then its radius is 28 cm.

Reason: Circumference = $2\pi r$

Q3. Assertion: The length of the minute hand of a clock is 7cm. Then the area swept by the Minute hand in 5 minutes is $12\ \frac{5}{6}$ cm^2.

Reason: The length of an arc of a sector of angle θ and radius r is given by *l* =

$\frac{\theta}{360^o} 2\Pi r$.

Q4. Assertion: A wire is looped in the form of a circle of radius 28 cm. It is bent into a square. Then the area of the square is 1936 cm^2.

Reason: Angle described by a minute hand in 60 minutes= 360°.

Q5. Assertion: If the outer and inner diameter of a circular path is 10 m and 6 m then area of the path is 16π m^2.

Reason: If R and r be the radius of outer and inner circular path = π (R^2 - r^2)

Q6. Assertion: A bicycle wheel makes 5000 revolutions in covering 11 km. Then diameter of the wheel is 35 cm.

Reason : Area of segment of a circle is $\frac{\theta}{360^o}\pi r^2 - \frac{1}{2} r^2 \sin\theta$.

Q7. Assertion: If a wire of length 22 cm is bent in the shape of a circle, then area of the circle so formed is 40 cm^2.

Reason: Circumference of the circle = length of the wire

Q8. Assertion: If the circumference of two circles are in the ratio 2:3 then ratio of their areas is 4:9.

Reason: The circumference of a circle of radius r is 2πr and its area is πr^2.

Q9. Assertion: An arc of a circle of radius 14 cm, subtends an angle of 45° at the centre, the length of minor arc is 11cm.

Reason: The circumference of a circle of radius r is 2πr and its area is πr^2.

Q10. Assertion: The area of the circle that can be inscribed in a square of side 6 cm is 9πcm^2.

Reason: The area of a circle of radius r is πr^2.

CHAPTER –PROBABILITY

KEY POINTS TO REMEMBER:

1. The difference between experimental probability and theoretical probability.

2. The theoretical (classical) probability of an event E, written as P(E), is defined as

$$P(E) = \frac{\text{Number of outcomes favourable to E}}{\text{Number of all possible outcomes of the experiment}}$$

where we assume that the outcomes of the experiment are equally likely.

3. The probability of a sure event (or certain event) is 1.

4. The probability of an impossible event is 0.

5. The probability of an event E is a number P(E) such that

$0 \leq P(E) \leq 1$

6. An event having only one outcome is called an elementary event. The sum of the probabilities of all the elementary events of an experiment is 1.

7. For any event E, P (E) + P ($\bar{E}$) = 1, where $\bar{E}$ stands for 'not E'. E and $\bar{E}$ are called complementary events.

MULTIPLE CHOICE QUESTIONS

Question 1. Which of the following cannot be the probability of an event?

(a) 0.7

(b) $\frac{2}{3}$

(c) -1.5

(d) 15%

Question 2. If the probability of an event is p, then the probability of its complementary event will be

(a) p – 1

(b) p

(c) 1 – p

(d) 1 - $\frac{1}{p}$

Question 3. Out of one digit prime numbers, Find the probability one selecting an even number is

(a) $\frac{1}{2}$

(b) $\frac{1}{4}$

(c) $\frac{4}{9}$

(d) $\frac{2}{45}$

Question 4. Out of vowels, of the English alphabet, one letter is selected at random. The probability of selecting 'e' is

(a) $\frac{1}{26}$ (c) $\frac{1}{4}$

(b) $\frac{5}{26}$ (d) $\frac{1}{5}$

Question 5. When a die is thrown, the probability of getting an odd number less than 3 is

(a) $\frac{1}{6}$ (c) $\frac{1}{2}$

(b) $\frac{1}{3}$ (d) 0

Question 6. A fair die is thrown once. The probability of getting an even prime number is

(a) $\frac{1}{6}$ (c) $\frac{1}{3}$

(b) $\frac{2}{3}$ (d) $\frac{1}{2}$

Question 7. A fair die is thrown once. The probability of getting a composite number is

(a) $\frac{1}{3}$ (c) $\frac{2}{3}$

(b) $\frac{1}{6}$ (d) 0

Question 8. If a fair dice is rolled once, then the probability of getting an even number or a number greater than 4 is

(a) $\frac{1}{2}$ (c) $\frac{5}{6}$

(b) $\frac{1}{3}$ (d) $\frac{2}{3}$

Question 9. Rashmi has a die whose six faces show the letters as given below:

$\boxed{A}$ $\boxed{B}$ $\boxed{C}$ $\boxed{D}$ $\boxed{A}$ $\boxed{C}$

If she throws the die once, then the probability of getting C is

(a) $\frac{1}{3}$ (c) $\frac{1}{5}$

(b) $\frac{1}{4}$ (d) $\frac{1}{6}$

Question 10. If a letter is chosen at random from the letters of English alphabet, then the probability that it is a letter of the word 'DELHI' is

(a) $\frac{1}{5}$ (c) $\frac{5}{26}$

(b) $\frac{1}{26}$ (d) $\frac{21}{26}$

Question 11. A card is drawn from a well-shuffled pack of 52 playing cards. The event E is that the card drawn is not a face card. The number of outcomes favourable to the event E is

(a) 51 (c) 36

(b) 40 (d) 12

Question 12. A card is drawn from a deck of 52 cards. The event E is that card is not an ace of hearts. The number of outcomes favourable to E is

(a) 4 (c) 48

(b) 13 (d) 51

Question 13. If one card is drawn from a well-shuffled pack of 52 cards, the probability of getting an ace is

(a) $\frac{1}{52}$ (c) $\frac{2}{13}$

(b) $\frac{4}{13}$ (d) $\frac{1}{13}$

Question 14. A card is selected at random from a well- shuffled deck of 52 cards. The probability of its being a face card is

(a) $\frac{3}{13}$ (c) $\frac{6}{13}$

(b) $\frac{4}{13}$ (d) $\frac{9}{13}$

Question 15. A card is selected at random from a pack of 52 cards. The probability of its being a red face card is

(a) $\frac{3}{26}$ (c) $\frac{2}{13}$

(b) $\frac{3}{13}$ (d) $\frac{1}{2}$

Question 16. If a card is drawn from a well-shuffled pack of 52 playing cards, then the probability of this card being a king or a jack is

(a) $\frac{1}{26}$ (c) $\frac{2}{13}$

(b) $\frac{1}{13}$ (d) $\frac{4}{13}$

Question 17. The probability that a non-leap year selected at random has 53 Sundays is.

(a) $\frac{1}{365}$ (c) $\frac{2}{7}$

(b) $\frac{2}{365}$ (d) $\frac{1}{7}$

Question 18. A bag contains 3 red balk, 5 white balls and 7 black balls. The probability that a ball drawn from the bag at random will be neither red nor black is

(a) $\frac{1}{5}$ (c) $\frac{7}{15}$

(b) $\frac{1}{3}$ (d) $\frac{8}{1}$

Question 19. A bag contains 4 red balls and 5 green balls. One ball is drawn at random from the bag. The probability of getting either a red ball or a green ball is

(a) $\frac{4}{9}$ (c) 0

(b) $\frac{5}{9}$ (d) 1

Question 20. A bag contains 5 red, 4 white and 3 black balls. If a. ball is drawn from the bag at random, then the probability of the ball being not black is

(a) $\frac{5}{12}$ (c) $\frac{3}{4}$

(b) $\frac{1}{3}$ (d) $\frac{1}{4}$

Question 21. One ticket is drawn at random from a bag containing tickets numbered 1 to 40. The probability that the selected ticket has a number which is a multiple of 5 is

(a) $\frac{1}{5}$ (c) $\frac{4}{5}$

(b) $\frac{3}{5}$ (d) $\frac{1}{3}$

Question 22. If a number is randomly chosen from the numbers 1, 2, 3, 4, …, 25, then the probability of the number to be prime is

(a) $\frac{7}{25}$ (c) $\frac{11}{25}$

(b) $\frac{9}{25}$ (d) $\frac{13}{25}$

Question 23. A box contains 90 cards numbered 1 to 90. If one card is drawn from the box at random, then the probability that the number on the card is a perfect square is

(a) $\frac{1}{10}$ (c) $\frac{1}{9}$

(b) $\frac{9}{100}$ (d) $\frac{1}{100}$

Question 24. If a (fair) coin is tossed twice, then the probability of getting two heads is

(a) $\frac{1}{4}$ (c) $\frac{3}{4}$

(b) $\frac{1}{2}$ (d) 0

Question 25. If two coins are tossed simultaneously, then the probability of getting at least one head is

(a) $\frac{1}{4}$ (c) $\frac{3}{4}$

(b) $\frac{1}{2}$ (d) 1

Question 26. Lakshmi tosses two coins simultaneously. The probability that she gets at most one head

(a) 1 (c) $\frac{1}{2}$

(b) $\frac{3}{4}$ (d) $\frac{1}{7}$

Question 27. The probability of getting a bad egg in a lot of 400 eggs is 0.035. The number of bad eggs in the lot is

(a) 7 (c) 21

(b) 14 (d) 28

Question 28. A girl calculates that the probability of her winning the first prize in a lottery is 0.08. If 6000 tickets are sold, how many tickets she has bought?

(a) 40 (c) 480

(b) 240 (d) 750

Question 29. A number is selected from first 50 natural numbers. What is the probability that it is a multiple of 3 and 5?

(a) $\frac{13}{25}$ (c) $\frac{12}{25}$

(b) $\frac{21}{50}$ (d) $\frac{23}{50}$

Question 30. In a family of 3 children, probability of having at least one boy is:

(a) $\frac{7}{8}$ (c) $\frac{5}{8}$

(b) $\frac{1}{8}$ (d) $\frac{3}{8}$

ASSERTION AND REASON

DIRECTION: In the following questions, a statement of assertion (A) is followed by a statement of reason (R). Mark the correct choice as:

(a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).

(b) Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).

(c) Assertion (A) is true but reason (R) is false.

(d) Assertion (A) is false but reason (R) is true.

Question 31. **Assertion:** If a die is thrown, the probability of getting a number less than 3 and greater than 2 is zero.

Reason: Probability of an impossible event is zero.

(a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).

(b) Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).

(c) Assertion (A) is true but reason (R) is false.

(d) Assertion (A) is false but reason (R) is true.

Question 32. **Assertion:** The probability of winning a game is 0.4, then the probability of losing it, is 0.6

Reason: P(E) + P (not E) = 1

(a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).

(b) Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).

(c) Assertion (A) is true but reason (R) is false.

(d) Assertion (A) is false but reason (R) is true.

Question 33. **Assertion:** If a box contains 5 white, 2 red and 4 black marbles, then the probability of not drawing a white marble from the box is $\frac{5}{11}$

Reason: $P(\text{not } E) = 1 - P(E)$, where E is any event

(a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).

(b) Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).

(c) Assertion (A) is true but reason (R) is false.

(d) Assertion (A) is false but reason (R) is true.

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Question 34. **Assertion:** An event is very unlikely to happen. Its probability is 0.0001

Reason: If $P(A)$ denote the probability of an event A, then $0 \leq P(A) \leq 1$.

(a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).

(b) Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).

(c) Assertion (A) is true but reason (R) is false.

(d) Assertion (A) is false but reason (R) is true.

Question 35**.** **Assertion:** In a simultaneously throw of a pair of dice. The probability of getting a doublet is $\frac{1}{6}$

Reason: Probability of an event may be negative

(a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).

(b) Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).

(c) Assertion (A) is true but reason (R) is false.

(d) Assertion (A) is false but reason (R) is true.

Question 36. **Assertion:** The probability of getting a prime number. When a die is thrown once is $\frac{2}{3}$

Reason: Prime numbers on a die are 2, 3, 5.

(a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).

(b) Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).

(c) Assertion (A) is true but reason (R) is false.

(d) Assertion (A) is false but reason (R) is true.

Question 37. **Assertion:** Card numbered as 1, 2, 3 ..... 15 are put in a box and mixed thoroughly, one card is then drawn at random. The probability of drawing an even number is $\frac{1}{2}$

Reason: For any event E, we have $0 \leq P(E) \leq 1$

(a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).

(b) Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).

(c) Assertion (A) is true but reason (R) is false.

(d) Assertion (A) is false but reason (R) is true.

Question 38.

Assertion: A box contains 20 balls bearing numbers 1,2,3,……..,20. A ball is drawn at random from the box. The probability that the number on the ball is odd number 1/3

Reason: probability of an event E, written as P(E), ids defined as

P(E)= (no of outcomes favourable to E) /(number of all possible outcomes of the experiment)

(a)Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).

(b)Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).

(c)Assertion (A) is true but reason (R) is false.

(d)Assertion (A) is false but reason (R) is true.

Question 39. Assertion: a game consists of tossing a coin three times and noting the outcome each time. If getting the same result in all the tosses is a success, then probability of losing the game is 3/4

Reason: In tossing 3 coins simultaneously, the possible outcomes are

HHH, HHT, HTH, THH,TTH,THT,HHT,TTT

(a)Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).

(b)Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).

(c)Assertion (A) is true but reason (R) is false.

(d)Assertion (A) is false but reason (R) is true

Question 40. Assertion: If each of the 25 numbers is equally likely to be selected ,then the probability that a number selected from the numbers 1,2,3,-------,25 is a prime number is 9/25

Reason: there exits 25 prime numbers in natural numbers 1 to 100.

(a)Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).

(b)Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).

(c)Assertion (A) is true but reason (R) is false.

(d)Assertion (A) is false but reason (R) is true

CASE STUDY BASED QUESTIONS

ITEM 1 - VISIT TO A FAIR

Sandeep goes to a fair in his village. There he saw a game having prizes – wall clocks, power banks, puppets and water bottles. The game consists of a box having cards inside it, bearing numbers 1 to 200, written on them. A person has to take out one card from the box without looking into it. He can win the following prizes:

Wall Clock – If the number on the card is a perfect square.

Power Bank – If the number on the card is a multiple of 3.

Puppet - If the number on the card is divisible by 10.

Water Bottle - If the number on the card is a prime number more than 100 and less than 150.

Try next time - If the number on the card is a perfect cube.

On the basis of above information answer the following questions:

Question 41. What is the probability of winning a Puppet?

(a) $\frac{1}{5}$ (b) $\frac{1}{8}$ (c) $\frac{1}{10}$ (d) $\frac{2}{15}$

Question 42. What is the probability of winning a Water Bottle?

(a) $\frac{1}{18}$ (b) $\frac{1}{19}$ (c) $\frac{1}{20}$ (d) $\frac{1}{16}$

Question 43. What is the probability of winning a Power Bank?

(a) $\frac{3}{10}$ (b) $\frac{11}{50}$ (c) $\frac{33}{100}$ (d) $\frac{1}{8}$

Question 44. What is the probability of winning a Wall Clock?

(a) $\frac{7}{100}$ (b) $\frac{51}{100}$ (c) $\frac{19}{100}$ (d) $\frac{27}{100}$

Question 45. What is the probability of Trying next Time?

(a) $\frac{1}{40}$ (b) $\frac{1}{80}$ (c) $\frac{1}{20}$ (d) $\frac{1}{60}$

ITEM 2 – JUICE STORE

Fatima goes to a juice store to buy carton of juice for her shop. The store has 80 cartons of orange juice, 90 cartons of apple juice, 38 cartons of mango juice and 42 cartons of guava juice. All the juice cartons are wrapped with brown paper with no label on them, it not possible to identify the type of juice. Juice store does not allow to remove the wrapper. Fatima chooses a carton from them.

On the basis of above information answer the following questions:

Question 46. What is the probability that the selected carton is of apple juice?

(a) $\frac{1}{25}$ (b) $\frac{8}{25}$ (c) $\frac{13}{25}$ (d) $\frac{9}{25}$

Question 47. What is the probability that the selected carton is not of orange juice?

(a) $\frac{14}{25}$ (b) $\frac{11}{25}$ (c) $\frac{17}{25}$ (d) $\frac{4}{25}$

Question 48. What is the probability that the selected carton is of guava juice?

(a) $\frac{51}{125}$ (b) $\frac{16}{125}$, (c) 0 (d) $\frac{21}{125}$

Question 49. Fatima buy 10 cartons of juice for her shop. On removing the wrappers, she finds that there are 4 cartons of apple juice, 3 cartons of orange juice and 3 cartons of guava juice. A customer picks up a tetra pack of juice randomly. What is the probability that customer picked up a tetra pack of guava juice, if each carton has 10 tetra packs?

(a) $\frac{1}{10}$ (b) $\frac{2}{10}$, (c) $\frac{3}{10}$ (d) $\frac{2}{5}$

Question 50. Customer finds that it was a pack of apple juice. He buys it and goes away. Another customer comes to the shop and picks up a tetra pack of juice randomly. What is the probability that the picked tetra pack is of apple juice?

(a) $\frac{13}{33}$ (b) $\frac{2}{5}$, (c) $\frac{3}{10}$ (d) $\frac{7}{20}$

ANSWER KEY

CHAPTER- REAL NUMBERS

1. B
2. D
3. B
4. C
5. D
6. C
7. A
8. C
9. B
10. A
11. A
12. C
13. B
14. A
15. D
16. B
17. C
18. C
19. C
20. A
21. (I) a, (ii) b, (iii) b, (iv) a, (v) c
22. (i) a, (ii) a, (iii) c, (iv) b,(v) c
23. B
24. C
25. B
26. B
27. (ii)
28. A
29. B
30. C
31. d
32. d
33. a
34. c
35. a
36. c
37. a
38. d
39. b
40. a

CHAPTER- POLYNOMIALS

1. (D) more than 3
2. (D)
3. (A) 0
4. (D) $-\sqrt{3}, -\frac{7}{\sqrt{3}}$
5. (C) parabola
6. (B) $x^2 - 5x$
7. (A) $\frac{4}{3}$
8. (C) $\frac{x^2}{2} - \frac{x}{2} - 6$
9. (D) $a = 0, b = -6$
10. (B) 0
11. (B) Intersects x-axis
12. (C) -21
13. (D) -3
14. (C) $k(2x^2 + 3x - 9)$
15. (A) $x = -2, x = -1$
16. (D) $-\frac{3}{2}, -9$
17. (B) $9x^2 + 82x + 9$
18. (A) 1
19. (C) $\frac{1}{3}$
20. (A) -1

CASE STUDY1

21. c) 'a' is a non-zero real number and b and c are constants of Polynomials.

22. d) $\frac{-b}{a}, \frac{c}{a}$

23. b) 1/4

24. d) 4

25. c) $k\left(x^2 + px - \frac{1}{p}\right)$

CASE STUDY2

26. d) Parabola

27. c) a < 0

28. c) 2

29. b) -2, 4

30. b) $-\frac{2}{\sqrt{3}}, \frac{\sqrt{3}}{4}$

ASSERTION REASONING BASED QUESTIONS

31. (c)

32. (b)

33. (b)

34. (d)

35. (c)

36. (d)

37. (a)

38. (b)

39. (a)

40. (d)

CHAPTER- LINEAR EQUATIONS ON TWO VARIABLES

1 (c)	9. (c)	17.(a)
2. (a)	10.(b)	18.(b)
3. (d)	11.(c)	19: (d)
4. (d)	12.(a)	20. (c)
5.(b)	13.(b)	21. (a)
6. (d)	14.(c)	22. (d)
7.(a)	15. (b)	23. (d)
8.(d)	16. (b)	24. (c)

CASE STUDY

1. (i) b (ii) (c)₹32000 (iii) (a)₹12000 (iv) (b)11 months.

2. (i) (a) (ii) (a)₹5 and ₹7 (iii) (b) 355

3. (i) (b) (ii) 40 years (iii) 20years (iv) 3:1

4. (i) (a) (ii) (a) (iii) (b) (iv)(a)

Assertion and reason based questions

1. (c)
2. (d)
3. (a)
4. (d)
5. (a)
6.(b)
7. (C)
8.(d)
9. (a)
10. (d)

CHAPTER -TRIANGLES

Q.1 . Ans.(a) Only Rahul

Q.2. Ans.(b) Equilateral Triangles

Q.3.Ans. **(a)** $x = 58°$, $y = 130°$

Q.4. (a) Basic Proportionality theorem

Q.5. (c) 1

Q.6. (c) 6

Q.7. (c) x = $\frac{a\,y}{a+b}$

Q.8. (c) AAA Similarity

Q.9 (c) AA similarity criterion

.Q.10. SSS similarity criterion

Q.11. (b) SAS similarity criterion

Q.12. (b) $\frac{DE}{PQ} = \frac{EF}{PR}$

Q.13.(d) 100^0 (by AAA similarity)

Q.14. (b) the square of the ratio of their corresponding sides

Q.15. (a) 5:12

Q.16. (c) 5cm

Q.17. (b) Pythagoras theorem

Q.18. (b) 7 cm, 24 cm, 25 cm

Q.19. (c) 75^0

Q.20. (b) $10\sqrt{2}$ cm (By Pythagoras theorem)

Q.21. **(a)** Triangles are similar by SAS

Q.22. (c) 10

Q.23. (c) 4:1

Q.24. (a) ΔFDE ~ ΔCAB

Q.25. (c) $\angle$B = $\angle$D

Q.26. (c) 90^0

Q.27 (c) 30 cm

Q.28.(b)$4 + 3\sqrt{3}$

Q.29. (b) 60cm

Q.30. (b) 4 cm

(CASE STUDY)

Q.1.(i) QR ∥ LM (ii) Converse of Basic proportionality theorem (iii) Δ PQR ~ Δ PLM (iv) 4.5 cm (v) 70^0

Q.2. (i) 100m (ii) 60m (iii) 40m (iv) 16m (v) 8m

Q.3. (i) Pythagoras Theorem (ii) 50m (iii) (21, 20, 28) (iv) 38m (v) 82m

.Q.4. (i) 22m (ii)They are not the mirror image of one another (iii) 0.7m (iv) Their altitudes have a ratio 25:15 (v) 4cm

(ASSERTION TYPES)

1. Ans: we know that if a line is parallel to one side of a triangle then it divides the other two sides in the same ratio.This is basic proportionality theorem.so reason is correct.

By Basic proportionality theorem

$\frac{AD}{DB} = \frac{AE}{EC}$

$\frac{X}{X-2} = \frac{X+2}{X-1}$

On Solving x=4

So assertion is correct

Correct option is (a) both assertion (A) and reason(R) is the correct explanation of assertion (A)

2. Ans. If a line divides any two sides of a triangle in the same ratio then it is parallel to the third side. This is the converse of the Basic proportionality theorem.

So reason is correct.

Therefore $\frac{AD}{DB} = \frac{AE}{EC}$

$\frac{4}{X-4} = \frac{8}{3X-19}$

On Solving x=11

So assertion is correct

Correct option is (b)

3. Ans: If a line divides any two sides of a triangle in the same ratio then it is parallel to the third side. This is the converse of the Basic proportionality theorem.

So reason is correct.

Therefore $\frac{AD}{DB} = \frac{5.7}{9.5} = \frac{57}{95} = \frac{3}{5}$

$\frac{AE}{EC} = \frac{4.8}{8} = \frac{3}{5}$

$\frac{AD}{DB} = \frac{AE}{EC}$

So. DE II BC

So assertion is not correct

Correct option is (d)

4. Ans: If a line is parallel to one side of a triangle then it divides the other two sides in the same ratio.This is basic proportionality theorem. So reason is correct

DB=10.8-6.3=4.5 and AE=9.6-4=5.6

$\frac{AD}{DB} = \frac{6.3}{4.5} = \frac{7}{5}$

$\frac{AE}{EC} = \frac{5.6}{4} = \frac{7}{5}$

$\frac{AD}{DB} = \frac{AE}{EC}$

So DE II BC

So assertion is correct

Correct option is (b)

5. Ans: We know that the ratio of the areas of two similar triangles is equal to the square of the ratio of their corresponding sides.

So reason is correct

$\frac{ar(ABC)}{ar(DEF)} = \frac{AB^2}{DE^2}$

$\frac{16}{49} = \frac{AB^2}{DE^2}$

$\frac{AB}{DE} = \frac{4}{7}$

So assertion is correct

Correct option is (a)

6. Ans: We know that if a line is parallel to one side of a triangle then it divides the other two sides in the same ratio. This is basic proportionality theorem. So, reason is correct.

By Basic proportionality theorem

$\frac{AD}{DB} = \frac{AE}{EC}$

$\frac{DB}{AD} + 1 = \frac{EC}{AE} + 1$

On Solving

$\frac{AD}{AB} = \frac{AE}{AC}$

So assertion is correct

Correct option is (a)

7. Ans. If the square of one side is equal to the sum of squares of other two sides, then the angle opposite to the largest side is right angle.

So, reason is correct

Now $AB^2 + BC^2 = 24^2 + 7^2 = 625 = AC^2$

$AB^2 + BC^2 = AC^2$

So, by converse of Pythagoras theorem ΔABC is a right angle triangle.

So assertion is correct

Correct option is (a)

8. If in a triangle square of one side is equal to the sum of the squares of other two sides then the angle opposite the first side is a right angle

So reason is correct

So, $AB^2 = 2AC^2 = AC^2 + AC^2$

$=BC^2 + AC^2$

$AB^2 = BC^2 + AC^2$

By converse of Pythagoras theorem, ΔABC is a right angle triangle.

So assertion is also correct

Correct option is (a).

9. **ANS :** If in a triangle square of one side is equal to the sum of the squares of other two sides then the angle opposite the first side is a right angle

So reason is correct

$AB^2 = BC^2 + AC^2$[AB=AC]

$AB^2 = 2AC^2$

So assertion is also correct.

Correct option is (b).

10. **ANS :** We know that If in a triangle, square of one side is equal to the sum of the squares of the other two sides, then the angle opposite the first side is a right angle.

So reason is correct.

Now $AB^2=(6\sqrt{3})^2=108$

$AC^2=(12)^2=144$

$BC^2=(6)^2=36$

$AC^2 = BC^2 + AB^2$

By converse of Pythagoras theorem $\angle B = 90^0$

So, assertion is also correct.

Correct option is (a)

CHAPTER- COORDINATE GEOMETRY

Question No	Answer
1	D
2	B
3	C
4	B
5	C
6	B
7	A
8	B
9	D
10	B
11	D
12	B
13	A
14	A
15	C
16	B
17	D
18	A
19	B
20	A
21	B
22	C
23	D
24	A
25	B
26	A
27	A
28	C

29	C
30	A
ASSERTION AND REASON	
Question No	**Answer**
1	A
2	D
3	C
4	A
5	C
6	A
7	A
8	A
9	A
10	B

THEME-1 **SCHOOL VISIT**	
Question No	**Answer**
1	C
2	D
3	C
4	D
5	B
THEME-2 **Travelling**	
Question No	**Answer**
1	B
2	B
3	B
4	D
5	A

THEME-3 **Covid-19 vaccination**	
Question No	**Answer**
1	A
2	C
3	B
4	C
5	D
THEME-4 **Sports Day**	
Question No	**Answer**
1	A
2	C
3	C
4	A
5	A
THEME-5 **Gardening**	
Question No	**Answer**
1	A
2	B
3	A
4	B
5	B
THEME-6 **Class room seating**	
Question No	**Answer**
1	A
2	C
3	B
4	A
5	C

CHAPTER- INTRODUCTION TO TRIGONOMETRY

1. (b) 0

2 . (b) $\sqrt{2}$

3. (d) 1

4. (b) 3/4

5. (a) $\sqrt{3}$

6. (a) 0

7. (d) 90°

8. (a)17/12

9 . (d)625/168

10. (b) 1/3

11 .(c)7/25

12 .(c) 17/8

13(a) 20°

14(b) 45°, 15°

15. (a) 0°

16. (c) 1

17 (a) 1

18 (b) 5/12

19 (b) 9

20 (d) cos A

21 (b) 1

22 (d) $\sqrt{2}$

23 (b) 0

24 (d) -11

25(d) 1

26 (c) 1

27(d) $\sin^2\beta$

28. (a)16/3

29. (a) 4

30 (a) 23

CASE STUDY 1

Q.1 (b) circle

Q.2 (b) 15°

Q.3 (c) 12 hrs

Q.4 (b) 135°

Q. 5 (a) 12 hrs

CASE STUDY 2

Q.1 b) 45^o

Q.2 a) 24.24 m

Q.3 a) $20\sqrt{3}$ m

Q.4 b) 45^o

Q. 5 c) angle of depression

ASSERTION AND REASONING

Q. 1 (d)

Q. 2 (a)

Q.3 (d)

Q.4 (b)

Q,5 (a)

Q. 6 (d)

Q .7 (a)

Q.8 (d)

Q.9 (a)

Q.10 (c)

CHAPTER- AREA RELATED TO CIRCLES

1B

2. C

3. D

4. B

5. B

6. A

7. C

8. A

9. C

10. C

11. D

12. C

13. B	19. A	25. B
14. A	20. C	26. A
15. C	21. C	27. C
16. B	22. B	28. D
17. C	23. B	29. A
18. B	24. C	30. B

Case Study 1

1.b) 2. c) 3.d) 4. c) 5. c)

Case Study 2

1.b) 2. c) 3.b) 4. d) 5. a)

ASSERSATION AND RESONING

1. (b) Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation ofassertion (A).
2. (a) Both assertion (A) and reason (R) are trueand reason (R) is the correct explanation of (A).
3. (b) Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation ofassertion (A).
4. (b) Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation ofassertion (A).
5. (a) Both assertion (A) and reason (R) are trueand reason (R) is the correct explanation of (A).
6. (d) Assertion (A) is false but reasons (R) is true.
7. (d) Assertion (A) is false but reasons (R) is true.
8. (a) Both assertion (A) and reason (R) are trueand reason (R) is the correct explanation of (A).
9. (b) Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation ofassertion (A).
10. (a)Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).

CHAPTER- PROBABILITY

Solution 1. (c) -1.5 (negative) cannot be a probability as probability lies between 0 to 1.

Solution 2. (c) Complementary of p is 1 – p

Solution 3. (b) One digit prime numbers are 2,3,5,7 = 4

Probability of an even number (i.e. 2) = $\frac{1}{4}$

Solution 4. (d)Vowels of English alphabets are a, e, I, o, u = 4

One letter is selected at random.

The probability of selecting 'e' = $\frac{1}{5}$

Solution 5. (a)

A die is thrown

Total number of events = 6

Odd number less than 3 is 1 = 1

Probability = $\frac{1}{6}$

Solution 6. (a)

A fair die is thrown once

Total number of outcomes = 6

Prime numbers =2,3,5 and even prime number is 2

Probability of getting an even prime number = $\frac{1}{6}$

Solution 7. (a)

A fair die is thrown once

Total number of outcomes = 6

Composite numbers are 4,6 = 2

Probability = $\frac{2}{6} = \frac{1}{3}$

Solution 8. (d)

A fair die is thrown once

Total number of outcomes = 6

Even numbers or a number greater than 4 are 2,4,5,6 = 4

Probability = $\frac{4}{6} = \frac{2}{3}$

Solution 9. (a)

A die having 6 faces bearing letters A, B, C, D, A, C

Total number of outcomes = 4

Probability of getting C = $\frac{2}{6} = \frac{1}{3}$

Solution 10. (c)

Total number of English alphabets = 26

Letters of Delhi are D, E, L, H, I = 5

Probability = $\frac{5}{26}$

Solution 11. (b)

Number of playing cards = 52

Probability of a card which is not a face card = (52 – 12) = 40

Number of possible events = 40

Solution 12. (d)

Total number of cards = 52

Balance (52 – 1) = 51

Number of possible events = 51

Solution 13. (d)

Total number of cards = 52

Number of aces = 4

Probability of card being an ace = $\frac{4}{52} = \frac{1}{13}$

Solution 14. (a)

Total number of cards = 52

Number of face cards = 12

Probability of face card= $\frac{12}{52} = \frac{3}{13}$

Solution 15. (a)

Total number of cards = 52

Number of red face cards = 6

Probability of being a red face card = $\frac{6}{52} = \frac{3}{26}$

Solution 16. (c)

Total number of cards = 52

Number of a king or a jack = 8

Probability of card being a king or a jack = $\frac{8}{52} = \frac{2}{13}$

Solution 17. (d)

Number of days in a non-leap year = 365

Number of Sundays = 53

In a leap year, there are 52 weeks or 364 days

One day is left

So Probability of Sunday = $\frac{1}{7}$

Solution 18. (b)

Total number of balls = 15

Possible outcomes that ball is neither red nor black = 15 – 10 = 5

Probability that ball is neither red nor black = $\frac{5}{15} = \frac{1}{3}$

Solution 19. (d)

Total number of balls = 9

Possible outcomes that ball is either red or green = 4 + 5 = 9

Probability that ball is either red or green = $\frac{9}{9} = 1$

Solution 20. (c)

Total number of balls = 12

Possible outcomes that ball is not black = 5 + 4 = 9

Probability that ball is not black = $\frac{9}{12} = \frac{3}{4}$

Solution 21. (a)

Total number of tickets = 40

Number of tickets which is multiple of 5 = 8

(5,10,15,20,25,30,35,40)

Probability that ticket is multiple of 5 = $\frac{8}{40} = \frac{1}{5}$

Solution 22. (b)

Total numbers = 25

Prime numbers are 2,3,5,7,11,13,17,19,23 = 9

Probability that number is Prime = $\frac{9}{25}$

Solution 23. (a)

Total numbers = 90

Perfect squares are 1,4,9,16,25,36,49,64,81 = 9

Probability that number is Prime = $\frac{9}{90} = \frac{1}{10}$

Solution 24. (a)

Number of outcomes = 4

Probability of two heads (HH = 1) = $\frac{1}{4}$

Solution 25. (c)

Number of outcomes = 4

Probability of getting at least one head (HH,HT,TH) = $\frac{3}{4}$

Solution 26. (b)

Number of outcomes = 4

Probability of getting at most one head (HT,TH,TT = 3) = $\frac{3}{4}$

Solution 27. (b)

Number of eggs = 400

Probability of getting a bad egg = 0.035

Number of bad eggs = 0.035 of 400 = 400 X $\frac{35}{1000}$ = 14

Solution 28. (c)

Number of tickets = 6000

Probability of winning first prize = 0.08

Number of tickets she bought = 0.08 of 6000 = 6000 X $\frac{8}{100}$ = 480

Solution 29. (d)

Total multiples of 3 and 5 are = 23

Required probability = $\frac{23}{50}$

Solution 30. (a)

Total children = 3

Total outcomes = 8

For at least one boy favourable outcomes = 8 – 1 (GGG) = 7

Required probability = $\frac{7}{8}$

Solution 31 (a)

Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A). Both statements are correct. Event given in Assertion is an impossible event

Solution 32. (a)

Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A). We have, $P(E) = 0.4$ where E = event of winning

$P(\text{Not } E) = 1 - P(E) = 1 - 0.4 = 0.6$

Solution 33. (d)

Assertion (A) is false but reason (R) is true. Assertion is not correct, but reason is correct.

$$P(\text{white marble}) = \frac{5}{11}$$

$$P(\text{not white marble}) = 1 - \frac{5}{11} = \frac{6}{11}$$

Solution 34. (b)

Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).

Solution 35. (c)

Assertion (A) is true but reason (R) is false.

When two dice are tossed.

Total possible outcomes = 36

Total favorable outcomes of doublet is (1,1),(2,2),(3,3),(4,4),(5,5),(6,6) = 6

Probability = $\frac{6}{36} = \frac{1}{6}$

Solution 36. (d)

Assertion (A) is false but reason (R) is true. When a die is thrown once, total possible outcomes =36

and prime numbers in it are 2,3,5

Total possible outcomes = 3

Probability of getting a prime = $\frac{3}{6} = \frac{1}{2}$

Solution 37. (d)

Assertion (A) is false but reason (R) is true.

Total possible outcomes =15

Total favourable numbers are 2, 4, 6, 8, 10, 12, 14 = 7

Probability of drawing an even number = $\frac{7}{15}$

Solution 38. (d)

Solution 39. (a)

Solution 40. (b)

Solution 41. (c)

Solution 42. (c)

Solution 43. (c)

Solution 44. (a)

Solution 45. (a)

Solution 46. (d)

Solution 47. (c)

Solution 48. (d)

Solution 49. (c)

Solution 50. (a)

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