THE STUDENT HUB

Sample Exam 1 - Solutions

Session 1 **Total: 75 marks**

SECTION I

1. Write down the value of the underlined digit in the place value chart below. [1]

Hundreds of Thousands	Tens of Thousands	Thousand	Hundred	Tens	Ones
4	7	<u>8</u>	0	9	9

The value of the underlined digit 8 is $8 \times 1000 = 8000$.

Answer_____ 8000 _____

2. Write down the smallest **prime** number in the box below. [1]

21	57	31
47	43	67

The prime numbers are 31, 47, 43 and 67. The smallest of these is 31.

Answer_____ 31 _____

3. What is $\frac{41}{3}$ as a mixed number? [1]

3 thirds = 1 whole,

41 thirds = 41 ÷ 3

= 13 wholes and 2 thirds

So, 41 thirds will be equivalent to $13\frac{2}{3}$

Answer_____ $13\frac{2}{3}$ _____

4. Calculate 22.2 ÷ 6 [1]

$$
\begin{array}{r}
03.7 \\
6\overline{)22.2} \\
-18 \\
\hline
42 \\
-42 \\
\hline
0
\end{array}
$$

Answer_____ 3.7 _____

5. Write the missing number in the box below to make the statement correct. [1]

$(23 \times 10) - (23 \times 4) = 23 \times \square$

$23 \times 10 = 10$ groups of 23

$23 \times 4 = 4$ groups of 23

$(23 \times 10) - (23 \times 4) = 6$ groups of 23

$= 23 \times 6$

Answer_____ $\square = 6$ _____

6. $4^2 - \sqrt{81} =$ [1]

$4^2 = 4 \times 4$

$= 16$

$\sqrt{81} = 9$ since $9 \times 9 = 81$

So, $4^2 - \sqrt{81} = 16 - 9$

$= 7$

Answer_____ 7 _____

7. $3 - \frac{3}{7} =$ [1]

$3 - \frac{3}{7} = 2 + 1 - \frac{3}{7}$

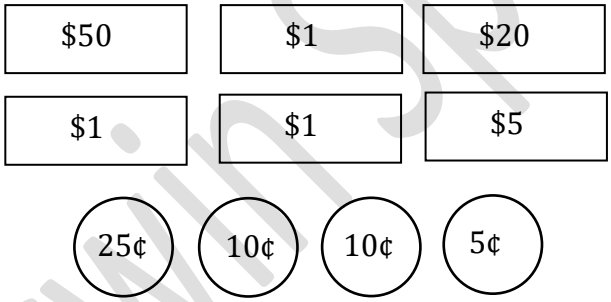
$= 2 + \frac{7}{7} - \frac{3}{7}$

$= 2 + \frac{4}{7}$

$= 2\frac{4}{7}$

Answer_____ $2\frac{4}{7}$ _____

8. Calculate the total value of the bills and coins below. [1]



Dollars = $50 + $1 + $20 + $1 + $1 + $5

= $78

Cents = 25¢ + 10¢ + 10¢ + 5¢

= 50¢

Total = $78 + 50 cents

Answer $_____ 78.50 _____

9. Multiply 254 by 12. [1]

$$\begin{array}{r} 254 \\ \times\ 12 \\ \hline 2540 \\ 508 \\ \hline 3048 \end{array}$$

Answer_____ 3048 _____

10. Insert the missing numbers in the boxes below. [1]

$$\begin{array}{r} 6\,\boxed{3}\,8 \\ +\ 5\ 3\ \boxed{9} \\ \hline 1\ 1\ 7\ 7 \end{array}$$

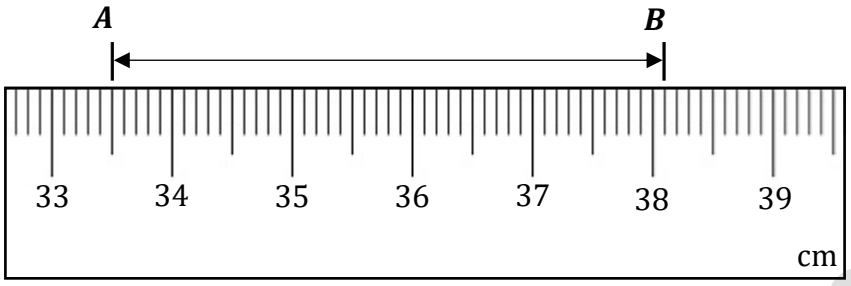
To get the 7 in the ones column, the sum of the ones must end in 7.

Adding the ones: $8 + \square = 17$, $\square = 9$

To get the 7 in the tens column, the sum of the tens must end in 7. We also have a ten from the ones column.

Adding the tens: $\square + 3 + 1 = 7$, $\square = 3$

11. What is the length, in cm, between points ***A*** and ***B***? [1]



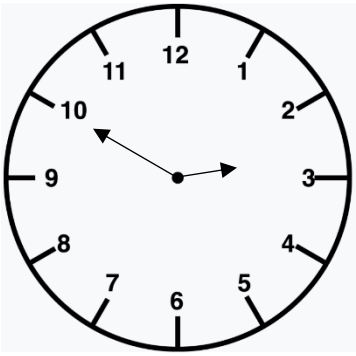
The distance of $AB = 38.1 \text{ cm} - 33.5 \text{ cm}$

$= 4.6 \text{ cm}$

Answer_____ 4.6 cm _____

12. The time is shown below on the analog clock. Write down the time on the digital clock. [1]

Analog clock



Digital clock

2 : 50

13. The calendar below is ripped at the bottom.

What is the date of the fourth Monday? [1]

October 2010						
Sun	Mon	Tues	Wed	Thurs	Fri	Sat
			1	2	3	4
5	6	7	8	9	10	11

Monday

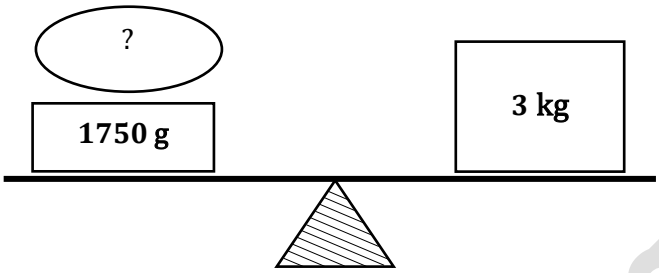
1st	6
2nd	6 + 7 = 13
3rd	13 + 7 = 20
4th	20 + 7 = 27

So, the 4th Monday is October 27th.

Answer_____ The 4th Monday is October 27th _____

14. Two objects balance the scale below.

What is the mass of the oval object? [1]



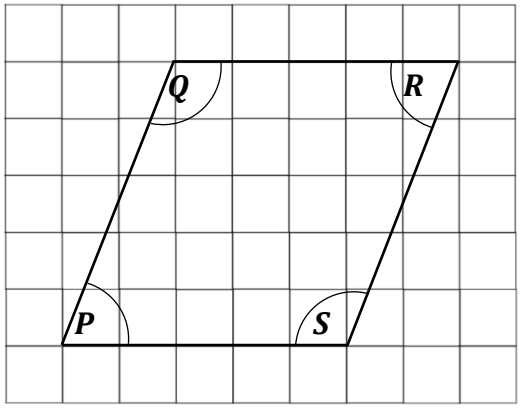
Mass of oval object = 3 kg – 1750 g

= 3000 – 1750

= 1250 g

Answer_____ 1250 _____ g

15. Looking at the diagram below, write down the two angles which are less than 90°. [1]



P appears to be less than 90°. Also, *R* appears to be less than 90°.

Q appears to be greater than 90°. Also, *S* appears to be greater than 90°.

Answer_____ Angles *P* and *R*_____

16. Write down the name of a solid that does **not** have a uniform cross-section. [1]

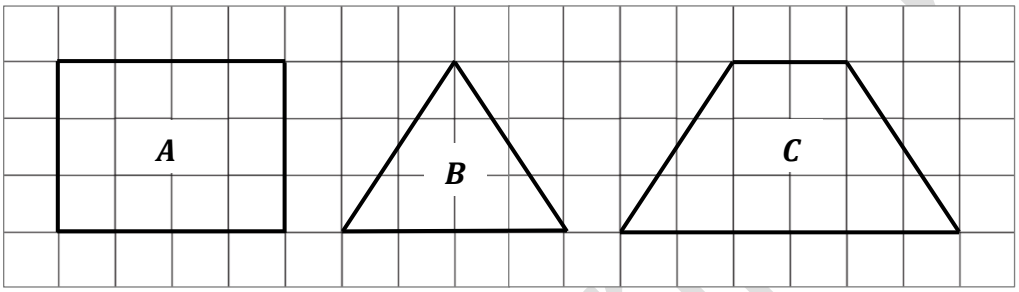
A cone does not have a uniform cross-section.

Other solids include sphere or pyramid.

Answer_____ cone _____

17. Write down the plane shape that has all the properties described in the table. [1]

Number of pairs of Parallel sides	Number of pairs of Equal sides	Number lines of Symmetry
2	2	2

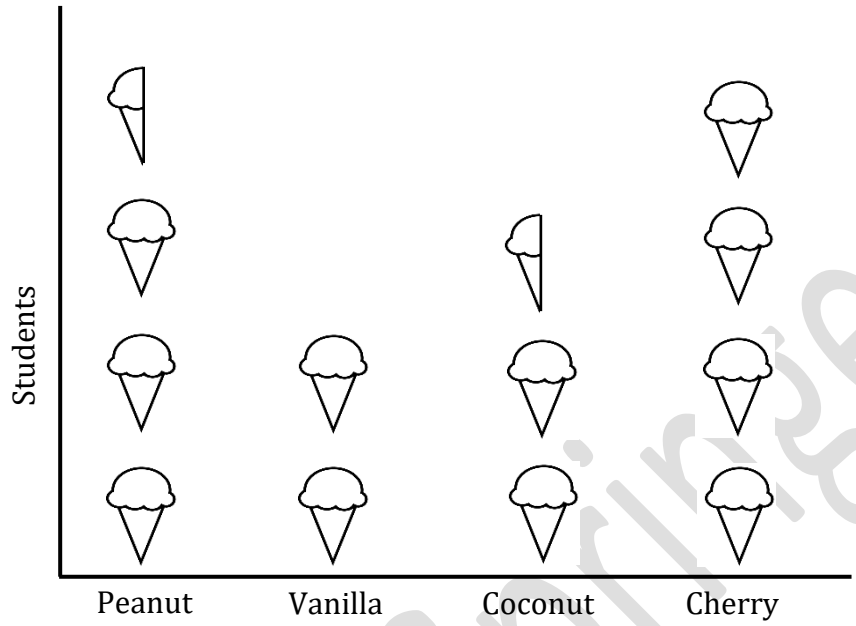


B has one pair of equal sides. *C* has one pair of equal sides.

A has 2 pairs of parallel sides, 2 pairs of equal sides and 2 lines of symmetry.

Answer_____ *A* _____

18. The pictograph below shows the favourite ice-cream flavour by 60 students.



How many students does  represent? [1]

Total number of  = 11

Total number of  = 2 (which is equivalent to 1 )

So, total number of  = 11 + 1 = 12

Therefore, 12  represents 60 students.

Hence, one  represents $\frac{60}{12} = 5$ students.

Answer_____ 5 students _____

19. The tally chart below shows the favourite subject by a class of 25 students.

Subject	Number of Students
Mathematics	𝍸 ||
English	𝍸 |||
History	𝍸 ||||
Science	𝍸 |

Name the subject that represents the mode. [1]

The mode will be History since it is chosen by most students.

Answer_____ History _____

20. The table below shows the number of cars sold in four weeks.

Week	Number of Cars Sold
Week 1	32
Week 2	23
Week 3	21
Week 4	40

Calculate the mean number of cars sold on a weekly basis. [1]

$$\text{Mean number of cars sold} = \frac{\text{Total number of cars sold over four weeks}}{\text{Number of weeks}}$$

$$= \frac{32+23+21+40}{4}$$

$$= \frac{116}{4}$$

$$= 29$$

Answer_____ 29 cars _____

Section II

21. Twenty-six paperclips fit exactly along the length of a table. Each paperclip has a length of 3.5 cm.

    Calculate the **total** length of the table. [2]

Total length of the table = Length of 1 paperclip × Number of paperclips

= 3.5 cm × 26

= 91 cm

Answer_____ 91 cm _____

22. A bottle contains 450 ml of orange juice. Carl drank 135 ml of the orange juice. What percent of orange juice is left in the bottle? [2]

Amount of orange juice in the bottle = 450 ml

Amount of orange juice Carl drank = 135 ml

Amount of orange juice remaining in the bottle = 4 5 0

$$\begin{array}{r} -\ 1\,3\,5 \\ \hline 3\,1\,5 \end{array}$$

Percent of orange juice remaining in the bottle $= \frac{Amount\ of\ juice\ remaining}{Amount\ of\ juice\ in\ the\ bottle} \times 100$

$= \frac{315}{450} \times 100$

$= 70\%$

Answer_____ 70% _____

23. Jane collected 56 seashells. She has $\frac{4}{9}$ the number of seashells that Dolly collected.

How many seashells did they collect **altogether**? [2]

Jane collected 56 seashells.

So, $\frac{4}{9}$ of the number of seashells that Dolly has is 56.

The number of seashells that Dolly has is

$56 \div \frac{4}{9} = 56 \times \frac{9}{4}$

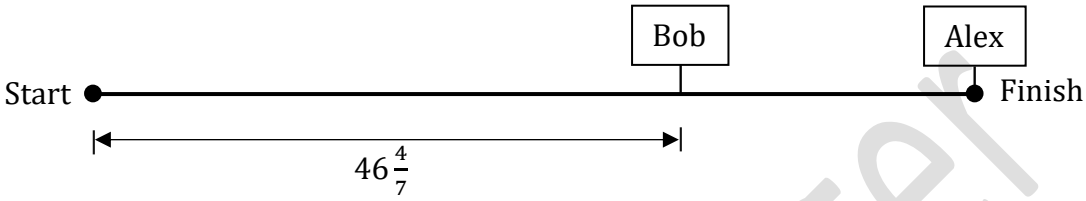
$= 126$

Together, they have

$$\begin{array}{r} 126 \\ +\ 56 \\ \hline 182 \end{array}$$

Answer_____ 182 seashells _____

24. The diagram below shows Alex and Bob in a race. Alex is at the finish line whereas Bob is $13\frac{3}{7}$ metres behind Alex.



What is the total distance from the start to the finish line? [2]

Distance from start to finish $= 46\frac{4}{7} + 13\frac{3}{7}$

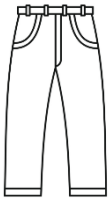
$= 46 + 13 + \frac{4}{7} + \frac{3}{7}$

$= 59 + 1$

$= 60$ m

Answer _____ 60 m _____

25. The prices of three different clothing items are shown below.



Pants
$70.00

T-Shirt
$25.00

Dress
$85.00

Fiona bought the clothing items shown in the table below.

Complete the table. [3]

Clothing Item	Quantity	Total Cost
Pants	2	$140.00
T-Shirt	3	$75.00
Dress	2	$170.00
TOTAL		$385.00

Total Cost = $385

Cost of the T-Shirt(s) = $385 − $140 − $170

= $75

One T-Shirt costs $25.

So, the number of T-Shirts bought = $\frac{\$75}{\$25}$

= 3

One pair of pants costs $70.

So, the number of pairs of pants bought $= \frac{\$140}{\$70}$

$= 2$

26. Mr. Singh gave the following question to his students.

$0.7 + 0.3 = \square$

Paul wrote $0.7 + 0.3 = \boxed{0.1}$

Sam wrote $0.7 + 0.3 = \boxed{1.0}$

Using words or diagrams, explain whose answer is correct. [3]

$$\begin{array}{r} 0.7 \\ +\ 0.3 \\ \hline 1.0 \end{array}$$

Alternatively,

$0.7 + 0.3 = \frac{7}{10} + \frac{3}{10}$

$= \frac{7+3}{10}$

$= \frac{10}{10}$

$= 1$ which is a whole or 1.0

So, Sam is correct.

Paul's answer is incorrect because when we add two numbers, the result is always larger than any one of the numbers. Paul's answer, 0.1 is smaller than 0.7 and also smaller than 0.3.

Therefore, Sam's answer is correct but Paul is incorrect.

Answer_____ Sam is correct _____

27. Consider the fractions $\frac{2}{3}$ and $\frac{2}{5}$. The numerators are the same but the denominators are different. Using words or diagrams to explain your answer, are the two fractions equal to each other? [3]

$\frac{\text{Numerator}}{\text{Denominator}}$ → tells us how many of the parts we are considering

→ tells us how many parts the whole is divided into

So, $\frac{2}{3}$ means we are looking at two parts of a whole divided into 3 parts.

$\frac{2}{5}$ means we are looking at two parts of a whole divided into 5 parts.

The diagrams show that $\frac{2}{3}$ is not equal to $\frac{2}{5}$.

In general, if we have the same numerators but different denominators, then the fractions will not be the same.

Answer_____ No, the two fractions are not equal to each other _____

28. A jar contains red and blue beads. In the jar, 65% of the beads are blue. All of the blue beads and 60% of the red beads were used in an art project.

Calculate the percentage of beads that were used in the project. [3]

Percent of blue beads in jar = 65%

So, the percent of red beads in jar = (100 − 65)%

= 35%

60% of the red beads = $\frac{60}{100} \times 35\%$

= 21%

So, the percent of beads that were used in the project = 65% + 21%

= 86%

Answer_____ 86% _____

29. Harry read a book over a period of 6 days. The number of pages read follows a pattern as shown in the table below. The numbers of pages read on Day 5 and Day 6 is **not** shown.

Day	1	2	3	4	5	6
Number of pages read	54	45	37	30		

How many pages were read altogether for the 6 days? [2]

The number of pages read appears to be decreasing by 1 more than the difference from the previous day.

$54 - 9 = 45$

$45 - 8 = 37$

$37 - 7 = 30$

So, we would expect $30 - 6$ pages to be read on Day 5 which is 24.

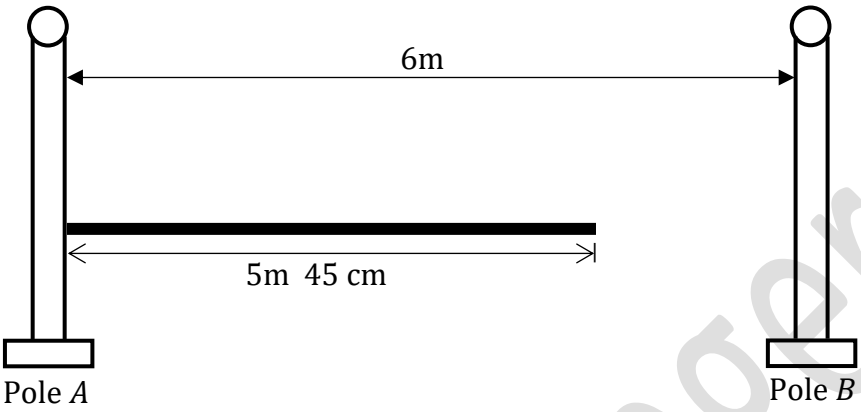
And $24 - 5$ pages to be read on Day 6 which is 19.

The total number of pages read $= 54 + 45 + 37 + 30 + 24 + 19$

$= 209$

Answer_____ 209 pages _____

30. The diagram below shows two poles and a wooden plank



How much of the wooden plank is needed to reach pole *B*? [2]

Distance between poles = 6 m

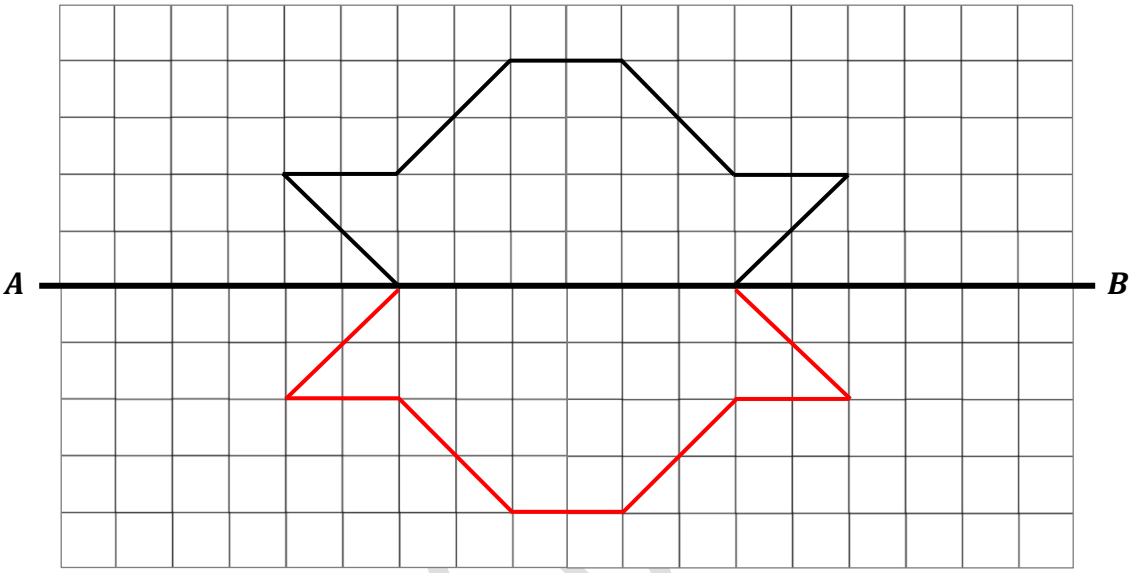
Length of wooden plank = 5 m 45 cm

So, the additional length of wooden plank needed to reach Pole *B* is

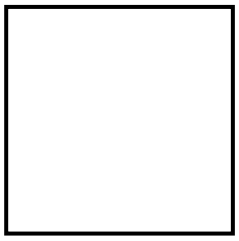
m	cm
6	00
5	45
	55

Answer_____ 55 cm _____

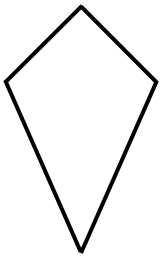
31. Complete the shape using ***AB*** as the line of symmetry. [2]



32. Two quadrilaterals are shown below.



Shape *A*



Shape *B*

Write two differences in the properties of Shape *A* and Shape *B*. [2]

Shape *A* appears to be a square.

Shape *B* appears to be a kite.

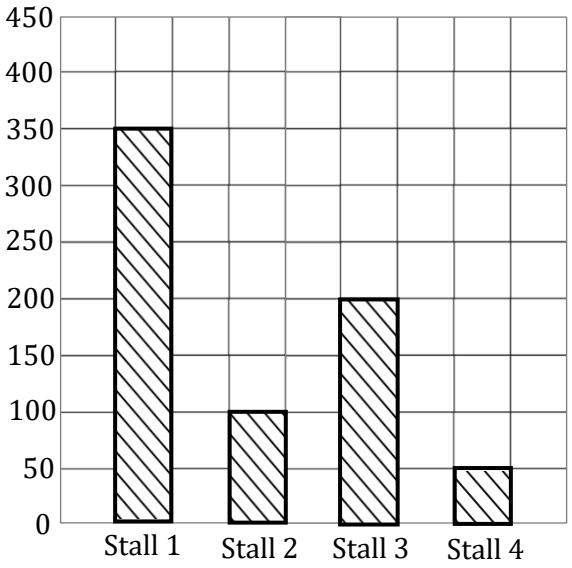
Answer: The four angles of Shape *A* are all right angles and none of the angles in Shape *B* are right angles. Shape *A* has two pairs of parallel sides while Shape *B* has no parallel sides.

33. Bill and Maxwell played a game where they both turned in an **anticlockwise** direction. Bill started the game facing South whilst Maxwell started the game facing North. Bill made quarter turns while Maxwell made half turns.

Complete the table below to show the direction each boy faced after each turn. [3]

Turn Number	**Bill**	**Maxwell**
0 (Start)	**South**	**North**
1	East	South
2	North	North
3	West	South
4	South	North

34. The bar graph below shows the number of concert tickets sold by 4 stalls.



The total number of tickets to be sold was 800.

Giving a reason for your answer, which Stall should be given more tickets to sell? [2]

Stall 1 sold the most tickets.

Total number of tickets sold = 350 + 100 + 200 + 50

= 700

Number of unsold tickets = 800 − 700

= 100

Answer: Stall 1 should be given more tickets to sell. Stall 1 appears to have good salesmen and are likely to sell off the remaining 100 unsold tickets.

35. The average number of runs a cricket player makes in 5 innings is 52. He wants to increase his average by 4 runs.

How many runs must he make in the 6th inning? [3]

The average number of runs after 5 innings is 52.

So, the total number of runs scored in 5 innings $= 52 \times 5$

$= 260$

If his average is to increase by 4, then it will be $52 + 4 = 56$.

After 6 innings, his total should be $56 \times 6 = 336$.

In the 6th inning, the cricket player needs to score $336 - 260 = 76$ runs.

Answer_____ 76 runs _____

36. Jason bought some notebooks and pens for school. Each notebook cost \$5.00 and each pen cost \$2.00. He bought 6 more pens than notebooks and his total bill is \$96.00.

Calculate the number of pens he bought. [3]

Jason spent a total of $\$2.00 \times 6 = \$12.00$ on the 6 pens.

Therefore, he would have spent the remaining $\$96.00 - \$12.00 = \$84.00$ on an equal number of notebooks and pens.

Now, 1 notebook and 1 pen cost $\$5.00 + \$2.00 = \$7.00$

Number of notebooks and pens bought with \$84 is $\frac{\$84}{\$7} = 12$.

So, \$60 will get him 12 notebooks $(12 \times \$5.00 = \$60.00)$

And \$24 will get him 12 pens $(12 \times \$2.00 = \$24.00)$

Hence,

Number of notebooks bought = 12 notebooks

Number of pens bought = 12 + 6

= 18 pens

Answer_____ 18 pens _____

Section III

37. Mrs. Jones took her three daughters to the mall. Here is a list of the different items that she bought.

List of Items	
	Teddy Bear $15.00
	Pair of shoes $35.00
	Dress $60.00

The total bill was $175.00. Each daughter received a teddy bear. Calculate the number of pairs of shoes and dresses Mrs. Jones bought. [4]

Cost of 3 Teddy Bears $= 3 \times \$15$

$= \$45$

So, the cost of the pairs of shoes and dresses $= \$175 - \$45$

$= \$130$

2 pairs of shoes at $35 cost $70

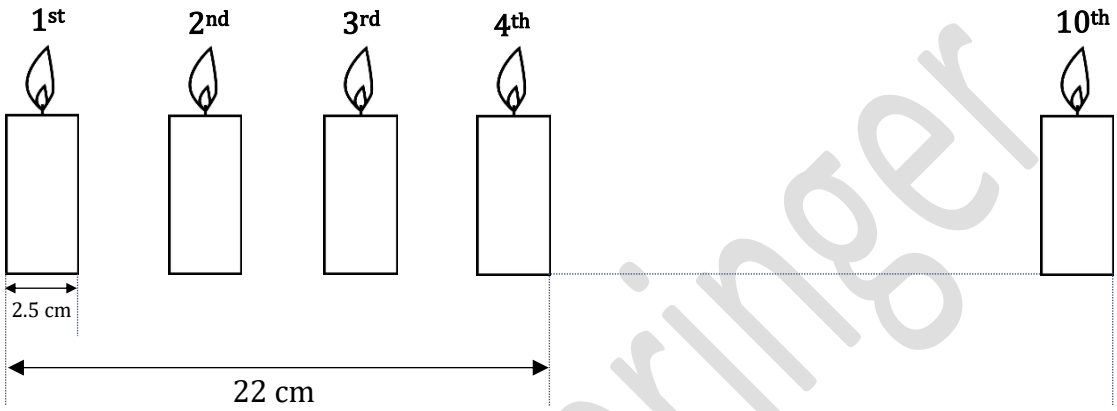
1 dress cost $60

Now,

$$\begin{array}{r} \$\ 70 \\ +\ \$\ 60 \\ \hline \$130 \end{array}$$

Answer_____ 2 pairs of shoes and 1 dress _____

38. Identical candles are being placed on a straight line at an equal distance from each other, as shown below. The total distance from the first candle to the fourth candle is 22 cm. Each candle has a width of 2.5 cm.



What is the total distance from the 3rd candle to the 10th candle? [4]

The space between each candle $= \frac{22-(4\times2.5)}{3}$

$= \frac{22-10}{3}$

$= \frac{12}{3}$

$= 4$ cm

From the 3rd to the 10th candle will have 7 spaces and 8 candles.

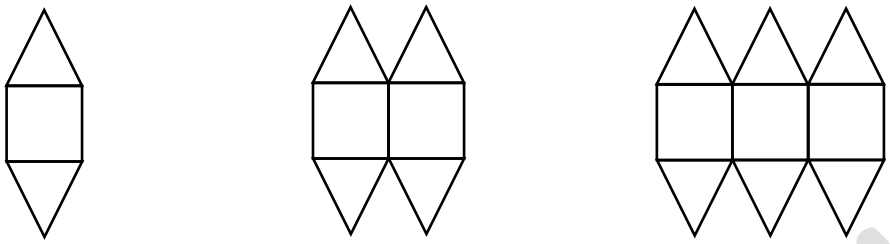
So, the total distance from the 3rd to the 10th candle $= (8 \times 2.5) + (7 \times 4)$

$= 20 + 28$

$= 48$ cm

Answer_____ 48 cm _____

39. Sticks are used to make the pattern below.



(a) How many sticks will be used to build a pattern with 5 squares? [1]

A pattern with 1 square requires 8 sticks.

A pattern with 2 squares requires 15 sticks.

A pattern with 3 squares requires 22 sticks.

A pattern with 4 squares requires 29 sticks.

A pattern with 5 squares requires 36 sticks.

$$8 \xrightarrow[+7]{} 15 \xrightarrow[+7]{} 22 \xrightarrow[+7]{} \overset{4^{th}}{29} \xrightarrow[+7]{} \overset{5^{th}}{36}$$

Answer_____ 36 sticks _____

(b) If 64 sticks are used to build a similar pattern, how many triangles will the pattern have? [3]

Therefore, 9th pattern will have 64 sticks.

The 9th pattern will consist of 9 squares.

So, the number of triangles in the 9th pattern = 9×2

$= 18$

Answer_____ 18 triangles _____

40. Nick has 320 marbles, Jack has 370 marbles, Gary has 280 marbles and Wade has 70 marbles.

How many marbles must Nick, Jack and Gary give to Wade such that the 4 boys will have the same number of marbles? [4]

Total number of marbles =

$$\begin{array}{r} 320 \\ 370 \\ 280 \\ +\ \ 70 \\ \hline 1040 \end{array}$$

To have the same number of marbles, each boy must have $\frac{1040}{4} = 260$ marbles.

So, Nick must give $320 - 260 = 60$ marbles to Wade and remain with 260 marbles.

Jack must give $370 - 260 = 110$ marbles to Wade and remain with 260 marbles.

And Gary must give $280 - 260 = 20$ marbles to Wade and remain with 260 marbles.

So, Wade will then have $70 + 60 + 110 + 20 = 260$ marbles.

Answer: Nick gives 60 marbles

Jack gives 110 marbles

Gary gives 20 marbles