THE STUDENT HUB

Sample Exam 10 – Solutions

Session 10 **Total: 75 marks**

SECTION I

1. Write in figures:
   Ninety-three thousand and seven. [1]

   93000
   \+ 7
   93007

   Answer_____ 93 007 _____

2. The number 146.45 is doubled. What is the new number? [1]

   146.45
   × 2
   292.90

   Answer_____ 292.90 _____

3. Divide 1064 by 8. [1]

   8 | 1064
   0133

   Answer_____ 133 _____

4. $\frac{6}{7}$ of $\square = 90$ [1]

$\square =$

$\square = \frac{7}{6} \times \frac{90}{1}$

$= 105$

Answer_____ 105 _____

5. Circle the number that is NOT a prime number.

19 73 (91) 13

[1]

19 is only divisible by 1 and itself without leaving a remainder so it is a prime number.

73 is only divisible by 1 and itself without leaving a remainder so it is a prime number.

13 is only divisible by 1 and itself without leaving a remainder so it is a prime number.

However, 91 is divisible by 1, 7, 13 and itself without leaving a remainder so it is **not** a prime number.

6. Calculate $\frac{5}{6} - \frac{3}{4}$ [1]

$\frac{5}{6} - \frac{3}{4} = \frac{(5\times4)-(3\times6)}{24}$

$= \frac{20-18}{24}$

$= \frac{2}{24}$

$= \frac{1}{12}$

Answer_____ $\frac{1}{12}$ _____

7. Find $\frac{3}{8}$ of 176 [1]

$\frac{3}{\cancel{8}_{1}} \times \frac{\cancel{176}^{22}}{1} = 66$

Answer_____ 66 _____

8. Convert $\frac{32}{7}$ to a mixed number. [1]

$32 \div 7 = 4$ remainder 4 (how many groups of 7 can you get from 32?)

The answer (excluding the remainder) represents the whole number in the mixed number.

Whole number $= 4$

The remainder becomes the numerator in the mixed number and is placed over the denominator of the proper fraction: $\frac{4}{7}$

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

9. Chelsea's percentage in her mock exam was 96%. If the mock exam's maximum score was 75 marks, how many marks did Chelsea lose?

[1]

Percentage of marks lost by Chelsea $= 100\% - 96\%$

$= 4\%$

Number of marks lost by Chelsea $= 4\%$ of 75 marks

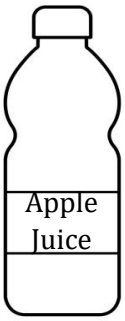
$= \frac{4}{100} \times \frac{75}{1}$

$= \frac{1}{25} \times \frac{75}{1}$

$= 3$ marks

Answer _____ 3 _____ marks

10. Judah purchased four bottles of the apple juice shown below. How much change did he receive from $20.00? [1]



$3.75

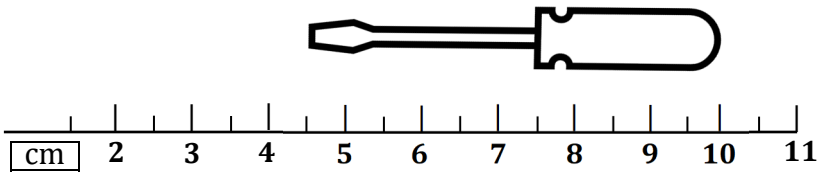
Cost of 1 bottle of apple juice = $3.75

Cost of 4 bottles of apple juice = 4 × $3.75
= $15.00

Change received by Judah = $20.00 – $15.00
= $5.00

Answer $_____ 5.00 _____

11. What is the length of the screwdriver, in centimetres? [1]

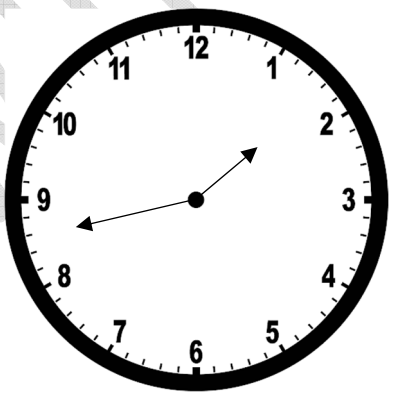


Length of screwdriver = 10 – 4.5

= 5.5 cm

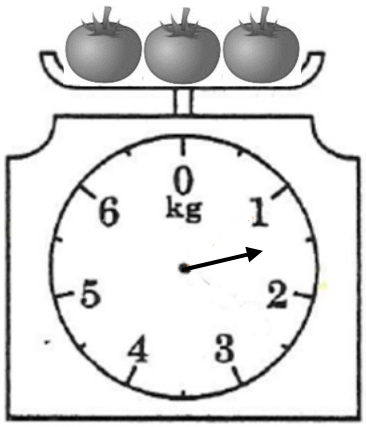
Answer _____ 5.5 _____ centimetres

12. Write the time shown on the clock. [1]



Answer _____ Forty-three minutes past one OR 1:43 _____

13. The scale below has 3 tomatoes being weighed.



What is the mass of ONE tomato in grams? [1]

Mass of 3 tomatoes = 1.5 kg

Mass of 1 tomato = $\frac{1.5}{3}$

= 0.5 kg

Converting to grams: 0.5 × 1000 = 500 grams

Answer_____ 500 _____ grams

14. The area of a square is 196 cm^2. Calculate the perimeter of the square. [1]

Area of a square = 196 cm^2

$S \times S = 196\ cm^2$

$S^2 = 196\ cm^2$

$S = \sqrt{196}$

$= 14$ cm

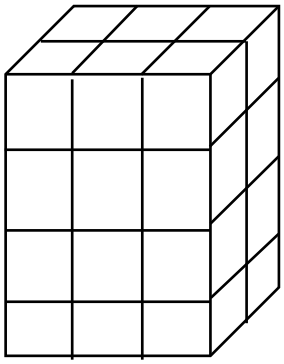
Perimeter of square = $S \times 4$

$= 14 \times 4$

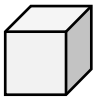
$= 56$ cm

Answer_____ 56 _____centimetres

15. The solid below is made up of cubes of the same size. What is the total volume of the solid? [1]



One Cube



Volume = 8 cm³

Number of cubes in solid = 24

Volume of one cube = 8 cm³

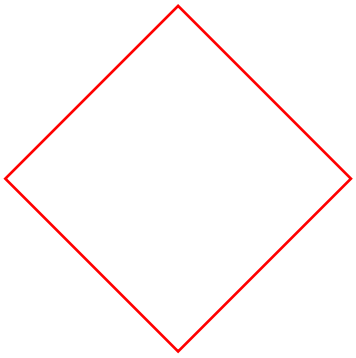
Volume of solid = 24 × 8 cm³

= 192 cm³

Answer_____ 192 _____ cm^3

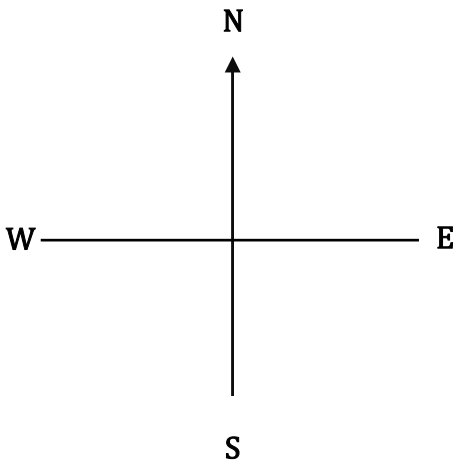
16. I am a quadrilateral with four equal sides. My opposite sides are parallel, my opposite angles are equal and diagonals bisect each other at right angles

What is my name? [1]



Answer_____ rhombus _____

17. Matthew was standing facing South. He turned in an anticlockwise direction and is now facing West.



Through how many degrees did Matthew turn? [1]

Matthew made three $\frac{1}{4}$ turns.

Number of degrees Matthew turned $= 3 \times 90°$

$= 270°$

Answer_____ 270 _____ degrees

18. The tally chart below shows the horoscopes of the students in a class.

The Horoscopes of Students

Horoscope	Tally	Frequency
Capricorn	𝍸 |	6
Gemini	𝍸 ||||	9
Libra	𝍸 𝍸	10
Aquarius	𝍸	5

Which horoscope represents the mode? [1]

Mode means the one which occurs most frequently.

Based on the table above, Libra represents the mode since it as the highest frequency (10).

Answer_____10_____

19. The table below shows Johnathan's marks in four sample exams.

Johnathan's Marks

Sample Exam	**1**	**2**	**3**	**4**
Marks obtained	72	68	70	74

What was Johnathan's mean mark? [1]

$$\text{Mean mark} = \frac{\text{Sum of marks}}{\text{Frequency}}$$

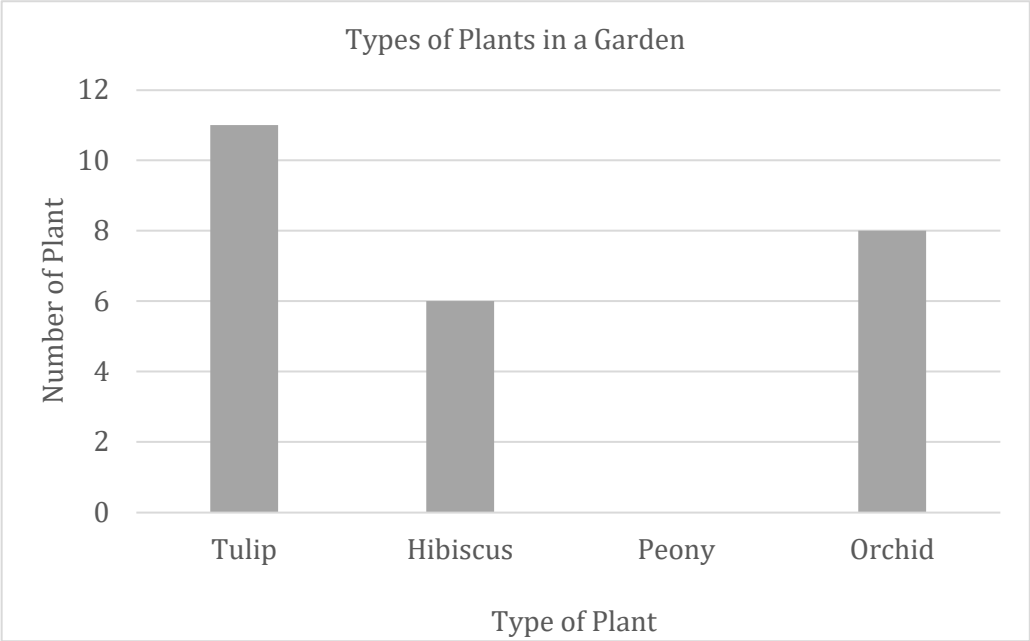
$$= \frac{72 + 68 + 70 + 74}{4}$$

$$= \frac{284}{4}$$

$$= 71 \text{ marks}$$

Answer_____ 71 _____ marks

20. The incomplete bar graph below shows the types of plants in a garden.



If there are 33 plants in the garden, how many peony plants are present? [1]

Total number of plants = 33 plants

Number of Tulips, Hibiscus and Orchid plants = 11 + 6 + 8
= 25 plants

Number of Peony plants = 33 – 25
= 8 plants

Answer_____ 8 _____ peony plants

SECTION II

21. 32% of a number is 112. What is $\frac{3}{7}$ of the number? [2]

32% of number = 112

$$\text{Whole number} = \frac{100}{32} \times \frac{112}{1}$$
$$= 350$$

$$\frac{3}{7} \text{ of the number} = \frac{3}{7} \times \frac{350}{1}$$
$$= 150$$

Answer_____ 150 _____

22. After a 15% discount, a lunch bag was sold for $119. Calculate the price of the lunch bag before the discount. [2]

Discount = 15%

Percentage paid for lunch bag = 100% - 15%

= 85%

Therefore, 85% of lunch bag price = $119

$$\text{Price of lunch bag before discount} = \frac{100}{85} \times \frac{119}{1}$$
$$= \$140$$

Answer $_____ 140 _____

23. Every sixth customer entering the amusement park was given a discount. The 129th person entered the amusement park. How many **more** persons must enter the amusement park for the next discount to be given? [2]

Discount given to every 6^{th} customer.

Number of persons who entered the amusement park = 129 persons

$$\text{Number of discounts given} = \frac{129}{6}$$
$$= 21.5$$
$$= 21 \text{ discounts}$$

Number of persons needed for 22^{nd} discount to be given = $129 - (21 \times 6)$
$= 129 - 126$
$= 3$ persons

Answer _____ 3 _____ persons

24. Zoe spent $\frac{1}{5}$ of her money on snacks and $\frac{2}{3}$ on travelling to and from school. Zoe saved the remainder.

If she had \$165, how much money did she save? [2]

Fraction spent on snacks and travelling $= \frac{1}{5} + \frac{2}{3}$

$= \frac{3 + 10}{15}$

$= \frac{13}{15}$

Remainder (fraction saved) $= \frac{15}{15} - \frac{13}{15}$

$= \frac{2}{15}$

Amount of money Zoe saved $= \frac{2}{15} \times 165$

$= \$22$

Answer \$ _____ 22 _____

25. Write the missing terms in the sequence below. [2]

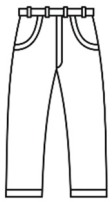
$\sqrt{121}+4$, $\sqrt{100}+8$, _____$\sqrt{81}+12$_____, $\sqrt{64}+16$, _____$\sqrt{49}+20$_____

$\sqrt{121}+4=11+4$

$\sqrt{100}+8=10+8$

We can see that the pattern is the square root of a number being decreased by 1 and then added to a multiple of 4.

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



Pants
$90.00

T-Shirt
$62.00

Dress
$115.00

Mrs. Andrews bought the clothing items shown in the table below. Complete the table. [2]

Clothing Item	Quantity	Total Cost
Pants	2	$180.00
T-Shirt	7	$434.00
Dress	3	$345.00
TOTAL		$ 959.00

Unit cost of T-Shirt = $62.00

Cost of T-Shirts bought by Mrs. Andrews = $434.00

Number of T-Shirts purchased by Mrs. Andrews = $\frac{\$434}{\$62}$

= 7 T-Shirts

TOTAL = $180.00 + $434.00 + $345.00

= $959.00

27. Malachi went to sleep at 9:15 p.m. He awoke at 7:25 a.m. to get ready to go to school. How long was Malachi asleep? [2]

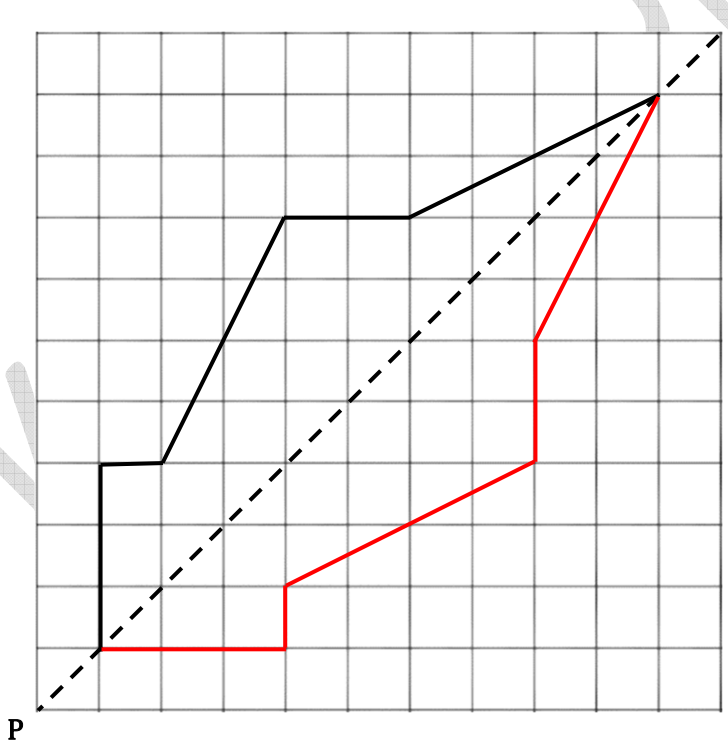
We need to subtract 9:15 p.m. from 7:25 a.m.

Since 7:25 a.m. is in the am period we can give it a +12 hour boost (since the pm period is 12 hours) and rewrite it as 19:25.

$$\begin{array}{r} 19:25 \\ -\ 9:15 \\ \hline 10:10 \end{array}$$

Answer_____ 10 _____ hours _____ 10 _____ minutes

28. Complete the shape shown below on the grid below using **PQ** as the line of symmetry. [3]



29. The square root of a number multiplied by 15 gives the same result as $\frac{5}{8}$ of 168.

What is the number? [3]

$\frac{5}{8}$ of $168 = \frac{5}{8} \times \frac{168}{1}$

$= 105$

Square root of number $\times 15 = \frac{5}{8}$ of 168

$\times 15 = 105$

Square root of number $= 105 \div 15$

$= 7$

Number = Square root of number^2

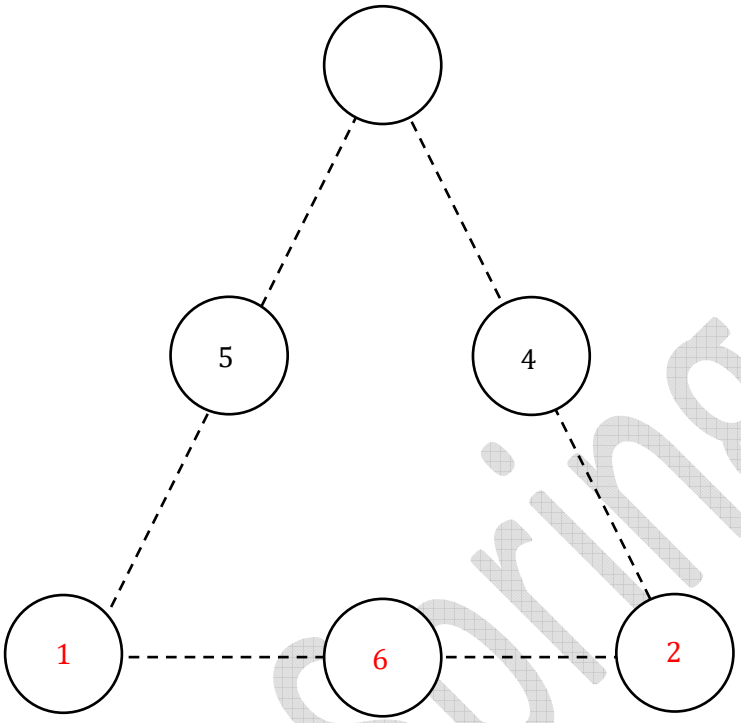
$= 7^2$

$= 7 \times 7$

$= 49$

Answer _____ 49 _____

30. Write the numbers 1, 2, 3 and 6 in the circles on the sides of the triangle below.
The sum of the numbers on each side of the triangle must total to 9. [3]



We cannot place 6 at the top because when adding the numbers on the diagonal sides, it will exceed 9. i.e. $(5 + 6 > 9)$

So, we place 6 on the bottom in the 2nd circle.

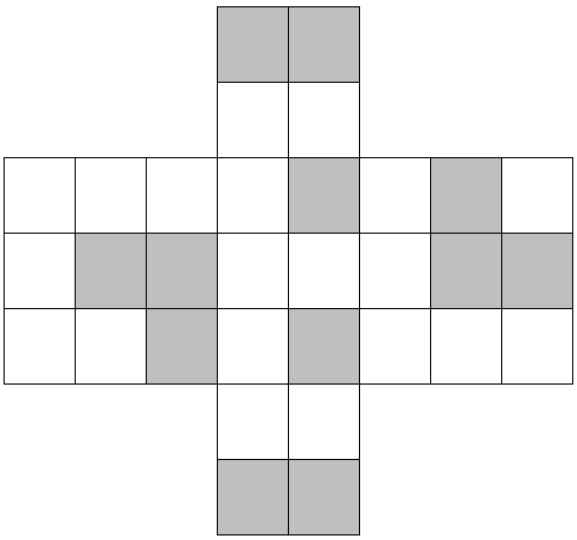
Next, we look at the remaining numbers 1,2 and 3 and figure out what added to 6 would result in the base of the triangle being equivalent to 9.

$6 + 1 + 2 = 9$

Hence, we are using 1 and 2 in the circles at the base at the remaining number, 3, goes on the top. The final arrangement is shown below.

$3 + 5 + 1 = 9$
$6 + 1 + 2 = 9$
$3 + 4 + 2 = 9$

31.



(a) State as a decimal the portion of the figure above that is shaded. [1]

Total number of parts in the figure = 32 parts

Number of shaded parts = 12 parts

Fraction of figure that is shaded = $\frac{12}{32}$

= $\frac{3}{8}$

As a decimal; $\frac{3}{8} = 0.375$

Answer _____ 0.375 _____

(b) What percentage of the figure above is unshaded? [2]

Fraction of the figure that is unshaded $= \frac{8}{8} - \frac{3}{8}$

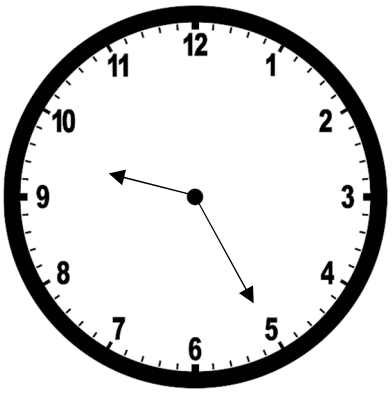
$= \frac{5}{8}$

Percentage of the figure that is unshaded $= \frac{5}{8} \times \frac{100}{1}$

$= 62.5\%$

Answer _____ 62.5 _____ %

32. The minute hand of the clock below is on 5.



If it moves to 1 in a clockwise direction. Through what angle does the minute hand turn? [2]

A circle has 360°.

The circle is divided equally into twelve angles at the centre.

Angle between any 2 numbers next to each other $= \frac{360°}{12}$

$= 30°$

The number of 30° angles between 5 and 1 on the clock above is 8.

Therefore, angle the minute hand turned $= 30° \times 8$

$= 240°$

Answer _____ 240 _____ degrees

33. A calculator and a geometry set cost \$250. The cost of the geometry set is 18% of the total cost. What is the cost of four calculators and three geometry sets? [3]

Cost of geometry set = 18% of the total cost

$$= \frac{18}{100} \times \frac{250}{1}$$

$$= \$45$$

Cost of calculator = \$250 – \$45

= \$205

Cost of 4 calculators and 3 geometry sets = $(4 \times \$205) + (3 \times \$45)$

= \$820 + \$135

= \$955

Answer \$_____ 955 _____

34. The mass of a bag of Oreos containing 28 packets is 672 grams. There are four cookies in each packet. What is the mass of one cookie? [2]

Mass of bag of Oreos = 672 grams

Number of packets in the bag of Oreos = 28 packets

$$\text{Mass of one packet of Oreos} = \frac{\text{Mass of bag of Oreos}}{\text{Number of packets in one bag of Oreos}}$$

$$= \frac{672}{28}$$

$$= 24 \text{ grams}$$

Number of cookies in one packet of Oreos = 4 cookies

$$\text{Mass of one cookie} = \frac{\text{Mass of one packet of Oreos}}{\text{Number of cookies in 1 packet}}$$

$$= \frac{24}{4}$$

$$= 6 \text{ grams}$$

Answer _____ 6 _____ grams

35. Janiah decided to make the pitcher of lemonade shown below to sell.

Pitcher

Cup

The lemonade was poured into cups, each holding 225 ml and sold for $5.50 each.

(a) How many full cups of lemonade were obtained from the pitcher? [2]

Volume of lemonade in pitcher $= 2.75 \times 1000$

$= 2750$ mL

$$\text{Number of full cups of lemonade} = \frac{\text{Volume of lemonade in pitcher}}{\text{Volume of lemonade in one cup}}$$

$$= \frac{2750}{225}$$

$= 12.222'$

$= 12$ cups

Answer _____ 12 _____ cups

(b) How much money did Janiah make if all full cups of lemonade were sold? [1]

Number of full cups of lemonade = 12 cups

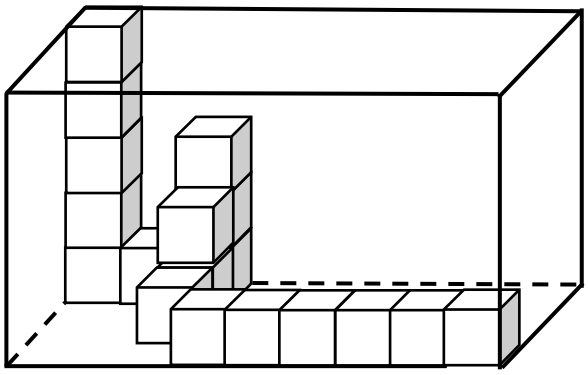
Selling Price of 1 cup = $5.50

Amount of money made by Janiah = 12 × $5.50

= $66.00

Answer $_____ 66 _____

36. Small identical cubes are placed inside a box as shown below.



(a) How many cubes can the box hold when filled completely? [2]

Number of cubes the box can hold when filled completely = $9 \times 4 \times 5$

= 180 cubes

Answer _____ 180 _____ cubes

(b) How many more of these cubes are needed to fill the box completely? [1]

Number of cubes the box can hold when filled completely = 180 cubes

Number of cubes presently in the box = 18 cubes

Number of cubes needed to fill the box = 180 – 18

= 162 cubes

Answer _____ 162 _____ cubes

SECTION III

37. 2 apples and 4 paw-paws cost $110. 6 apples and 8 paw-paws cost $230.

Calculate the total cost of 3 apples and 3 paw-paws. [4]

2 apples + 4 paw-paws = $110

The difference is 4.

6 apples + 8 paw-paws = $230

4 apples + 4 paw-paws = $250 – $180

= $120

1 apple + 1 paw-paw $= \frac{120}{4}$

= $30

Therefore,

Cost of 3 apples and 3 paw-paws = 3 × $30

Cost of 3 apples and 3 paw-paws = $90

Answer $_____ 90 _____

38. The table below shows rates per minute for two phone networks.

	The Red Network	The Green Network
DAY **6:00 a.m. to 6:00 p.m.**	$1.35	$1.40
NIGHT **6:00 p.m. to 6:00 a.m.**	$0.90	$0.98

(a) Josiah's phone on The Red Network has $29.70 credit. He wants to call his friend on Sunday at noon. How long will the call last if he uses all his credit? [1]

Day Rate on The Red Network = $1.35

Credit on Josiah's phone = $29.70

$$\text{Duration the call will last} = \frac{\text{Credit on phone}}{\text{Day Rate on The Red Network}}$$

$$= \frac{\$29.70}{\$1.35}$$

$$= 22 \text{ minutes}$$

Answer _____ 22 _____ minutes

(b) Zuri called her grandmother on Tuesday using The Green Network. The call began at 5:45 p.m. and lasted 34 minutes. How much did the call cost? [3]

Time call began = 5:45 p.m.

Time call ended = 5:45 p.m. + 0:34

= 6:19 p.m.

Since the night rate goes into effect at 6:00 p.m., Zuri's call will be calculated using both the day and night rates.

Day Rate on The Green Network = $1.40

Night Rate on The Green Network = $0.98

Number of minutes billed using the Day Rate = 6:00 p.m. – 5:45 p.m.

= 15 minutes

Cost of 15 minutes = 15 × $1.40

= $21.00

Number of minutes billed using the Night Rate = 6:19 p.m. – 6:19 p.m.

= 19 minutes

Cost of 19 minutes = 19 × $0.98

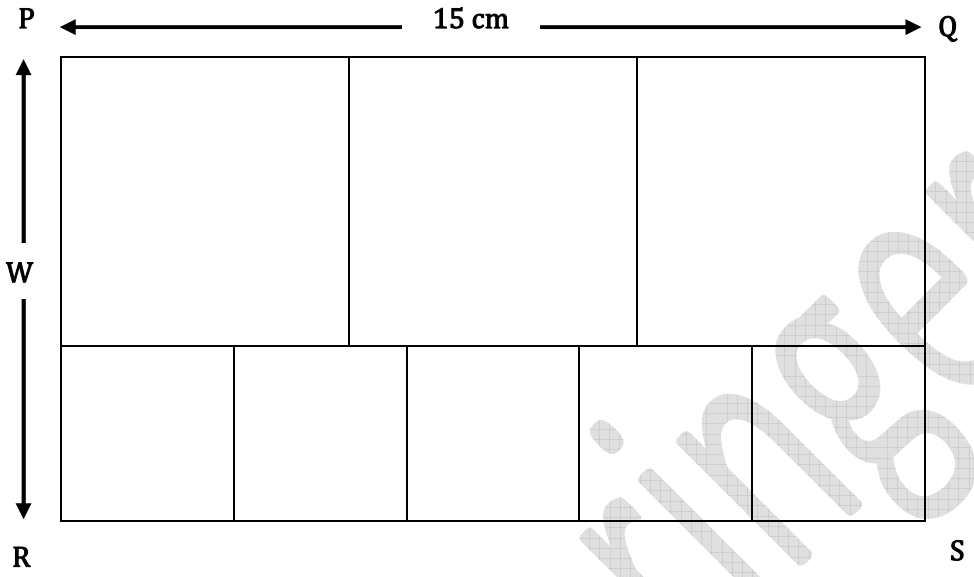
= $18.62

Total cost of Zuri's call = $21.00 + $18.62

= $39.62

Answer $_____ 39.62 _____

39. Rectangle PQRS below is made with three large identical squares and 5 small identical squares as shown in the diagram below.



(a) Find the length of each side of the small squares. [1]

Length of each side of the small squares $= \frac{15}{5}$

$= 3$ cm

Answer _____ 3 _____ cm

(b) What is the width, **W**, of the rectangle **PQRS**? [1]

Width, **W**, of the rectangle **PQRS** = Length of one side of the large squares + Length of one side of the small squares

$= 5 + 3$

$= 8$ cm

Answer _____ 8 _____ cm

(c) Calculate the area of rectangle **PQRS**. [2]

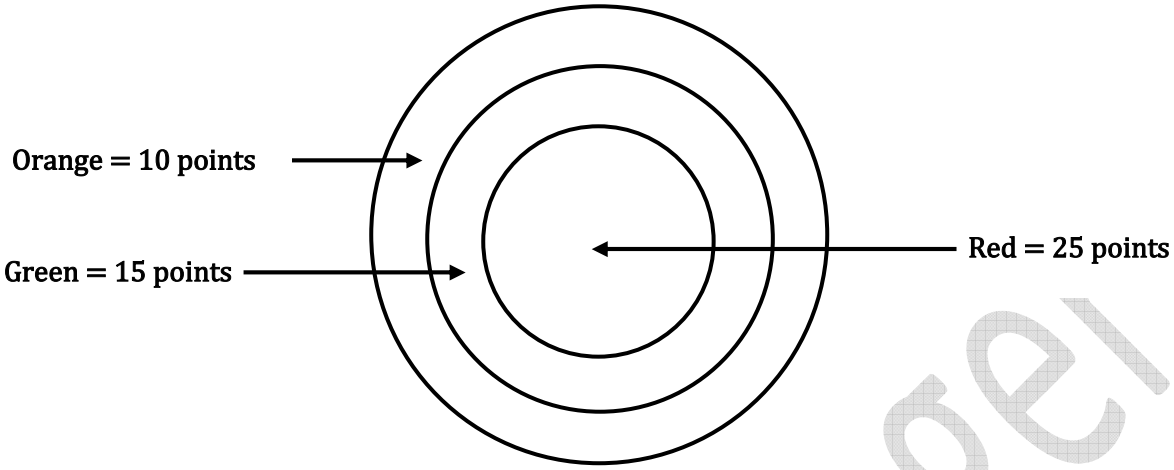
Area of rectangle **PQRS** = Length × Width

= 15 × 8

= 120 cm²

Answer _____ 120 _____ cm^2

40. The points system for hits in a darts game is illustrated below.



(a) Isaiah threw the darts and hit orange twice and red once. What was his total score? [1]

Hit orange twice = 2×10

= 20 points

Hit red once = 25 points

Isaiah's total score = $20 + 25$

= 45 points

Answer _____ 45 _____ points

(b) Atiya scored a total of 95 points where she hit each colour at least once.

Complete the results sheet below to show how she scored the 95 points. [3]

Colour	Number of Hits	Points Gained
Orange	3	30
Green	1	15
Red	2	50
TOTAL		**95**

Atiya's total score = 95 points

Number of points based on red hits = 50 points

Number of times she hit red = $\frac{50}{25}$

= 2 times

1 orange hit = 10 points

1 green hit = 15 points

Number of points Atiya earned by hitting red twice and orange and green once = 50 + 10 + 15

= 75 points

Number of points unaccounted for = 95 – 75

= 20 points

Now this means that Atiya did not hit green again as 1 green hit is equal to 15 points.

This would leave a remainder of 5 points and none of the colours are equal to 5 points.

Therefore, Atiya's remaining hits were orange.

$$\text{Number of orange hits} = \frac{20}{10}$$
$$= 2 \text{ hits}$$

$$\text{Total number of orange hits} = 1 + 2$$
$$= 3 \text{ hits}$$