

Sample Exam 3 – Solutions

Session 3

Total: 75 marks

SECTION I

1. Write the numeral that represents four hundred and eleven thousand, nine hundred and one. [1]

$$\begin{array}{r}
 411000 \\
 900 \\
 + \quad 1 \\
 \hline
 411901
 \end{array}$$

Answer \_\_\_\_\_ 411 901 \_\_\_\_\_

2. Arrange these numbers in ASCENDING order (smallest first). [1]

5168          5861          5681          5186

All four numbers have their thousands digit as 5, so we cannot distinguish the smallest by looking at the 5.

Looking at the hundreds digit in the order stated, we see, 1, 8, 6, 1. Of these, 8 is the largest, then 6. Hence, 5861 is the largest number and 5681 is the second largest number.

We have 5168 and 5186 and observe that their tens digits are 6 and 8 respectively. Since 6 is smaller than 8, 5168 is smaller than 5186.

The numbers, in ascending order, that is, smallest number first will be,  
5168, 5186, 5681, 5861

Answer \_\_\_\_\_ 5168, 5186, 5681, 5861 \_\_\_\_\_

3. Express 0.52 as a common fraction.

[1]

$$0.52 = \frac{52}{100}$$

$$= \frac{13}{25}$$

Answer \_\_\_\_\_  $\frac{13}{25}$  \_\_\_\_\_

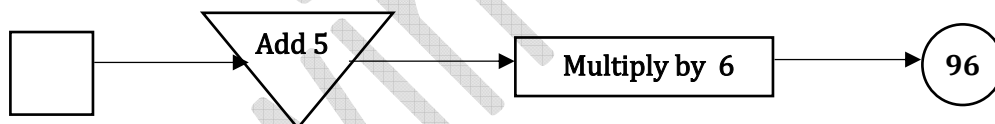
4. Circle the 7 that has the value of 7 hundredths.

[1]

7 7 7 . 7 7

5. What number must be placed in the box to give the result shown?

[1]



Using the reverse process and starting from the result of 96, we get:

[Divide by 6]

$$96 \div 6 = 16$$

[Subtract 5]

$$16 - 5 = 11$$

Answer \_\_\_\_\_ **11** \_\_\_\_\_

6. Write  $\frac{29}{7}$  as a mixed number.

[1]

7 sevenths = 1 whole

29 sevenths =  $29 \div 7$  wholes

$$\begin{array}{r} 4 \\ 7 \overline{) 29} \\ \underline{-28} \\ 1 \text{ remainder} \end{array}$$

Therefore,  $\frac{29}{7} = 4$  wholes and  $\frac{1}{7}$

=  $4\frac{1}{7}$  as a mixed number

Answer \_\_\_\_\_  $4\frac{1}{7}$  \_\_\_\_\_

7. Write the next term in the sequence.

[1]

1, 9, 17, 25, \_\_\_\_\_ **33** \_\_\_\_\_

1  $\xrightarrow{+8}$  9  $\xrightarrow{+8}$  17  $\xrightarrow{+8}$  25  $\xrightarrow{+8}$  33

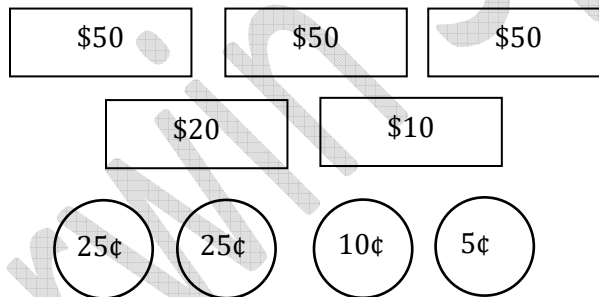
8. Multiply 181 by 21.

[1]

$$\begin{array}{r}
 181 \\
 \times 21 \\
 \hline
 3620 \\
 181 \\
 \hline
 3801
 \end{array}$$

Answer \_\_\_\_\_ **3801** \_\_\_\_\_

9. Franklin went to the store to buy a shirt. He used the bills and coins below to buy the shirt. Calculate the cost of the shirt. [1]

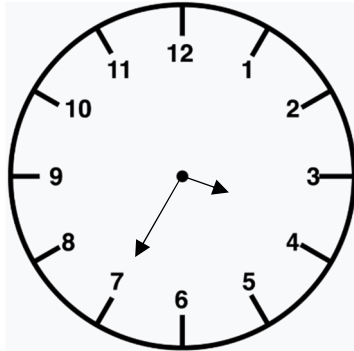


$$\begin{aligned}
 \text{Cost} &= \$50 + \$50 + \$50 + \$20 + \$10 + \$0.25 + \$0.25 + \$0.10 + \$0.05 \\
 &= \$180.65
 \end{aligned}$$

Answer \$ \_\_\_\_\_ **180.65** \_\_\_\_\_

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

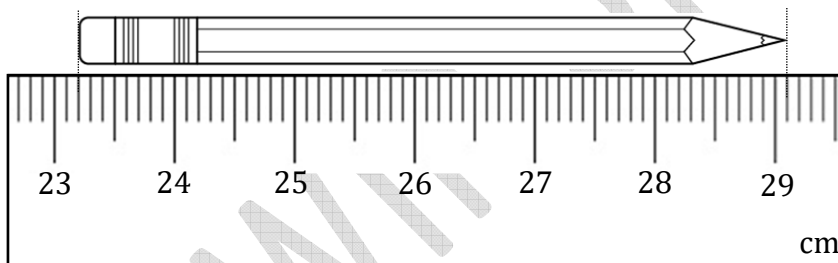
Analog clock



Digital clock

3 : 35

11. What is the length of the pencil shown below? [1]



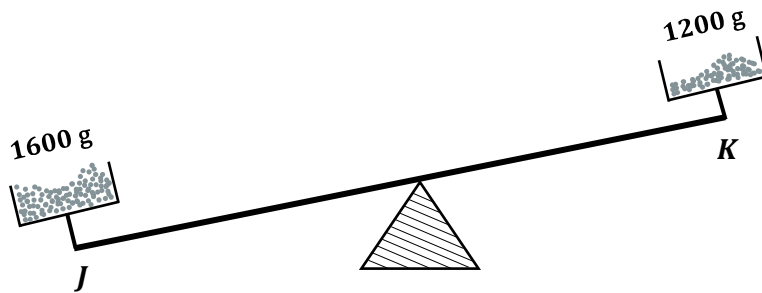
$$\text{Length of pencil} = 29.1 - 23.2$$

$$= 5.9 \text{ cm}$$

$$\begin{array}{r} 29.1 \\ - 23.2 \\ \hline 5.9 \end{array}$$

Answer \_\_\_\_\_ 5.9 \_\_\_\_\_ cm

12. How many grams must be removed from *J* and placed on *K*, to balance the scale? [1]



*J* weighs 1 600 g

*K* weighs 1 200 g

For the scale to balance, both sides must have the same weight. To obtain this weight, we must find the total on both sides and divide this total by 2.

$$(1600 + 1200) \div 2 = 2800 \div 2 \\ = 1400$$

Hence, 1400 g must be on each side.

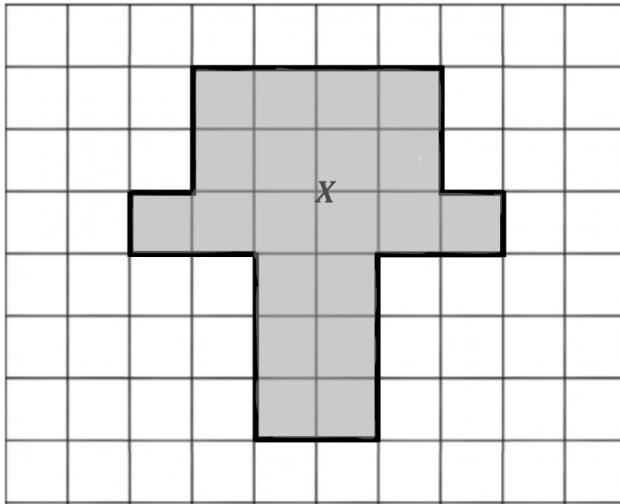
So, if  $1600 - 1400 = 200$  g is removed from *J*, then *J* will weigh 1400 g.


When this 200 g is added to *K*, it will now weigh  $1200 + 200 = 1400$  g.

Both will now weigh 1400 g and the scale will balance.

Answer \_\_\_\_\_ 200 \_\_\_\_\_ grams

13. In the diagram below, each square has an area of  $9 \text{ cm}^2$ .



Area  =  $9 \text{ cm}^2$

Calculate the area of Shape X.

[1]


The shape is composed of 20 squares.

So, the area of the shape =  $20 \times 9 \text{ cm}^2$

=  $180 \text{ cm}^2$

Answer 180  $\text{cm}^2$

14. The calendar below is ripped at the bottom. What is the date of the fourth Wednesday? [1]

June 2009						
Sun	Mon	Tues	Wed	Thurs	Fri	Sat
		1	2	3	4	5
6	7	8	9	10	11	12
						

Wednesday

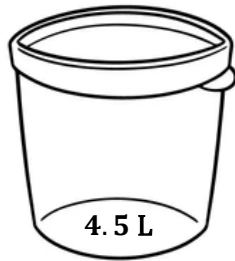
1 <sup>st</sup>	2
2 <sup>nd</sup>	$2 + 7 = 9$
3 <sup>rd</sup>	$9 + 7 = 16$
4 <sup>th</sup>	$16 + 7 = 23$

So, the 4<sup>th</sup> Wednesday is June 23<sup>rd</sup>.

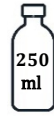
Answer \_\_\_\_\_ The 4<sup>th</sup> Wednesday is June 23<sup>rd</sup> \_\_\_\_\_



15. An empty container and a full bottle of milk are shown below.



Container



Milk

How many bottles of milk will fill the container? [1]

$$4.5 \text{ L} = 4.5 \times 1000$$

$$= 4\,500 \text{ ml}$$

$$250 \text{ ml} = 1 \text{ bottle}$$

$$4\,500 \text{ ml} = \frac{4\,500}{250}$$

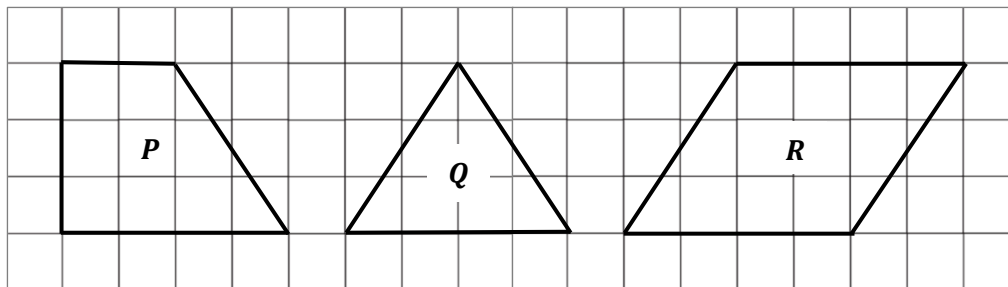
$$= 18 \text{ bottles}$$

Answer 18 bottles

16. 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 of lines of Symmetry
0	1	1



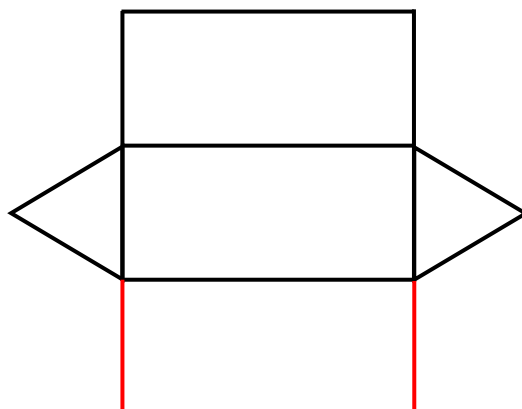
*P* has one pair of parallel sides. *R* has two pairs of parallel sides.

*Q* has 0 pairs of parallel sides, 1 pair of equal sides and 1 lines of symmetry.

Answer \_\_\_\_\_ *Q* \_\_\_\_\_

17. Complete the drawing below to show the net of a triangular prism.

[1]



18. The table below shows the number of stickers Kristal used in the four Art projects she completed.

**Kristal's stickers**

	Project 1	Project 2	Project 3	Project 4
Stickers used	54	63	43	52

Calculate the mean of the number of stickers used.

[1]

$$\text{Mean} = \frac{\text{Total Number of Stickers}}{\text{Number of projects}}$$

$$= \frac{54+63+43+52}{4}$$

$$= \frac{212}{4}$$

$$= 53$$

Answer \_\_\_\_\_ **53** \_\_\_\_\_ stickers

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19. There are 30 girls in a summer camp. The incomplete tally chart below shows the favourite Disney princess chosen by some of the students.

Princess	Number of Girls
Mulan	
Belle	
Jasmine	
Cinderella	

How many students chose Belle? [1]

$$\begin{aligned} \text{Number of girls who chose Mulan} &= 5 + 2 \\ &= 7 \end{aligned}$$

$$\begin{aligned} \text{Number of girls who chose Jasmine} &= 5 + 5 + 1 \\ &= 11 \end{aligned}$$

$$\text{Number of girls who chose Cinderella} = 3$$

$$\begin{aligned} \text{Total number of girls who chose Mulan, Jasmine and Cinderella} &= 7 + 11 + 3 \\ &= 21 \end{aligned}$$

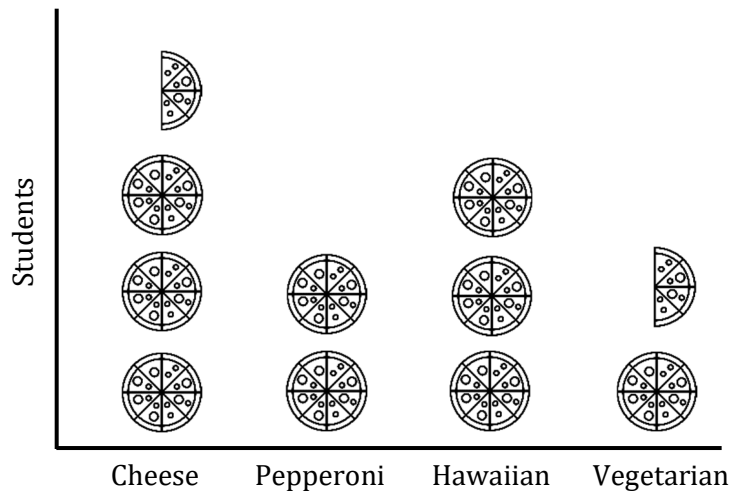
$$\text{Total girls in the camp} = 30$$


Hence,

$$\begin{aligned} \text{The number of girls who chose Belle} &= 30 - 21 \\ &= 9 \end{aligned}$$

Answer \_\_\_\_\_ 9 \_\_\_\_\_ students

20. The pictograph below shows the pizza preference of 40 students.



How many students does  represent?

[1]

Total number of  = 9

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

So, total number of  =  $9 + 1 = 10$

Therefore, 10  represents 40 students.

Hence, one  represents  $\frac{40}{10} = 4$  students.

Answer \_\_\_\_\_ 4 \_\_\_\_\_ students

SECTION II

21.  $5\frac{1}{3} + 3\frac{3}{4} =$

[2]

We have  $5 + 3 = 8$ .

Now,

$$\begin{aligned} \frac{1}{3} + \frac{3}{4} &= \frac{4}{12} + \frac{9}{12} \\ &= \frac{4+9}{12} \\ &= \frac{13}{12} \\ &= 1\frac{1}{12} \end{aligned}$$

Hence,

$$8 + 1\frac{1}{12} = 9\frac{1}{12}$$

Answer                      $9\frac{1}{12}$                     

22. Write the correct number in each shape below to complete the number sentences.

[2]

$$153 \times 20 = (151 + \textcircled{1}) \times 20 + 20$$

$$153 \times 20 = \boxed{152} \times 20 + 20$$

23. One of the stadium sections has 12 rows where each row has 20 seats. All of the seats in 7 rows were completely occupied while 12 seats in the 8<sup>th</sup> row were **not** occupied.  
How many seats were **not** occupied altogether in the stadium section? [2]

8 rows contained some number of occupied seats.

So,  $12 - 8 = 4$  rows were completely unoccupied.

$$\begin{aligned} 4 \text{ rows with all 20 seats not occupied will have} &= 4 \times 20 \\ &= 80 \text{ not occupied seats} \end{aligned}$$

12 seats were not occupied in the 8<sup>th</sup> row.

$$\begin{aligned} \text{Total number of not occupied seats} &= 80 + 12 \\ &= 92 \text{ seats} \end{aligned}$$

Answer \_\_\_\_\_ 92 \_\_\_\_\_ seats

24. In each school, there are 4 headmasters and 2 security guards. Altogether, there are 168 headmasters and security guards employed in various schools around the country. How many security guards are employed? [2]

$$\begin{aligned} \text{Each school has} &= 4 + 2 \\ &= 6 \text{ persons} \end{aligned}$$

Altogether, there are 168 headmasters and security guards.

$$\begin{aligned} \text{Number of security guards} &= \frac{168}{6} \\ &= 28 \times 2 = 56 \end{aligned}$$

Answer \_\_\_\_\_ 56 \_\_\_\_\_ security guards

25. Debbie bought 70 m of satin ribbon. She used  $\frac{9}{14}$  of the ribbon to wrap gift boxes. She cuts the remaining ribbon into equal lengths to make decorative bows. Each bow was made with  $\frac{5}{12}$  m of satin ribbon.

How many decorative bows did she make?

[3]

$$\begin{aligned} \text{Fraction of satin ribbon used to make decorative bows} &= 1 - \frac{9}{14} \\ &= \frac{14}{14} - \frac{9}{14} \\ &= \frac{5}{14} \end{aligned}$$

$$\begin{aligned} \text{Amount of satin ribbon used to make decorative bows} &= \frac{5}{14} \times 70 \\ &= 25 \text{ m} \end{aligned}$$

$$\frac{5}{12} \text{ m} = 1 \text{ decorative bow}$$

$$25 \text{ m} = 25 \div \frac{5}{12}$$

$$= 25 \times \frac{12}{5}$$

$$= 60 \text{ decorative bows}$$

Answer 60 bows



26. A waiter shared a carton of juice between two tables. He gave  $\frac{1}{3}$  to Table 1 and  $\frac{3}{4}$  of the remainder to Table 2.

(a) What fraction of the carton of juice did Table 2 receive? [1]

Consider the whole as 1.

$\frac{1}{3}$  is given to Table 1.

$$\begin{aligned} \text{Remainder} &= 1 - \frac{1}{3} \\ &= \frac{3}{3} - \frac{1}{3} \\ &= \frac{2}{3} \end{aligned}$$

Table 2 got

$$\begin{aligned} \frac{3}{4} \text{ of the remainder} &= \frac{3}{4} \times \frac{2}{3} \\ &= \frac{6}{12} \\ &= \frac{1}{2} \end{aligned}$$

Answer \_\_\_\_\_  $\frac{1}{2}$  \_\_\_\_\_

(b) What fraction of the total amount of juice did the waiter serve the two tables? [2]

$$\begin{aligned} \text{The fraction of juice the two tables received} &= \frac{1}{3} + \frac{1}{2} \\ &= \frac{2}{6} + \frac{3}{6} \\ &= \frac{2+3}{6} \\ &= \frac{5}{6} \end{aligned}$$

Answer \_\_\_\_\_  $\frac{5}{6}$  \_\_\_\_\_

27. A store made \$556.00 from selling a certain number of DVDs and CDs. Each DVD costs \$19.00 and each CD costs \$11.00. The store sold 4 **more** DVDs than CDs.

Find the number of DVDs sold.

[3]

$$1 \text{ DVD} = \$19$$

$$1 \text{ CD} = \$11$$

$$4 \text{ DVDs} = 4 \times \$19$$

$$= \$76$$

$$\text{Remove excess} = \$556 - \$76$$

$$= \$480$$

$$1 \text{ DVD and 1 CD} = \$19 + \$11$$

$$= \$30$$

$$\text{Number of groups} = \frac{\$480}{\$30}$$

$$= 16$$

$$\text{Total DVDs sold} = 4 + 16$$

$$= 20$$

Answer 20 DVDs

28. A container holds red and yellow marbles. In the container, 55% of the marbles are yellow. All of the yellow marbles and 40% of the red marbles were used in a game.

Calculate the percentage of marbles used in the game.

[3]

Percent of yellow marbles in the container = 55%

So, the percent of red marbles in jar =  $(100 - 55)\%$

$$= 45\%$$

$$40\% \text{ of the red marbles} = \frac{40}{100} \times 45\%$$

$$= 18\%$$

So, the percent of marbles that were used in the project =  $55\% + 18\%$

$$= 73\%$$

Answer 73 %

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29. A sheet of paper is  $67\frac{1}{5}$  cm wide. The teacher asks a student to cut the sheet into strips, each of width 3.2 cm. How many strips can be cut from the sheet? [2]

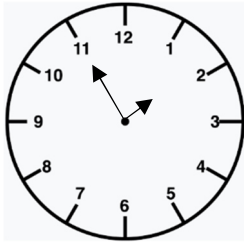
$$\begin{aligned}\text{Width of 1 strip of paper} &= 3.2 \text{ cm} \\ &= 3\frac{1}{5} \text{ cm}\end{aligned}$$

$$\text{Width of sheet of paper} = 67\frac{1}{5} \text{ cm}$$

$$\begin{aligned}\text{The number of strips that can be cut from the sheet} &= \frac{\text{Width of sheet of paper}}{\text{Width of 1 strip of paper}} \\ &= \frac{67\frac{1}{5}}{3\frac{1}{5}} \\ &= 67\frac{1}{5} \div 3\frac{1}{5} \\ &= \frac{336}{5} \div \frac{16}{5} \\ &= \frac{336}{5} \times \frac{5}{16} \\ &= 21 \text{ strips}\end{aligned}$$

Answer 21 strips

30. The clock below is  $\frac{7}{12}$  of an hour slow.



What is the correct time?

[2]

$$\begin{aligned} \frac{7}{12} \text{ of an hour} &= \frac{7}{12} \times \frac{60}{1} \\ &= 35 \text{ minutes} \end{aligned}$$

The time on the clock is 1:55.

Now,

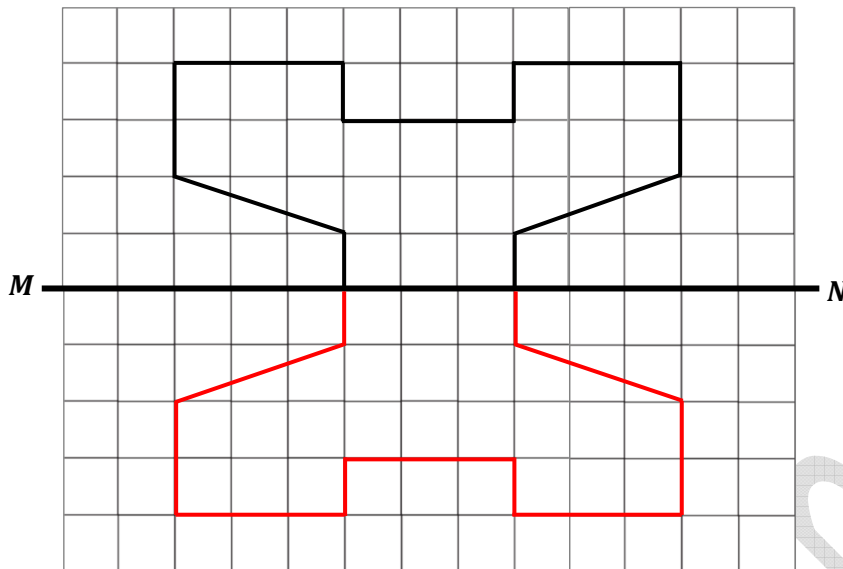
$$\begin{array}{r} 1:55 \\ + 0:35 \\ \hline 1:90 \\ - \quad 60 \\ \hline 2:30 \end{array}$$

The correct time is 2:30.

Answer                     2:30

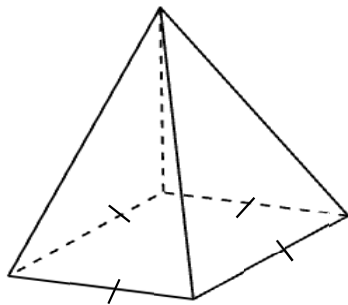
31. Complete the shape using  $MN$  as the line of symmetry.

[3]



32. (a) Name the solid below.

[1]




Answer \_\_\_\_\_ **square-based pyramid** \_\_\_\_\_

(b) How many vertices are in the solid?

[1]

Answer \_\_\_\_\_ **5** \_\_\_\_\_ vertices

33. Consider the pattern below where in Pattern 1, there are 3 lines and 1 dot.

Pattern 1 

Pattern 2 

Pattern 3 

(a) Draw Pattern 4 in the space below. [1]

Pattern 4 is shown below:



(b) How many lines will be used to make Pattern 9? [2]

Pattern 1 = 3 lines

Pattern 2 = 7 lines

Pattern 3 = 11 lines

Pattern 4 = 15 lines

Pattern 5 =  $15 + 4 = 19$  lines

Pattern 6 =  $19 + 4 = 23$  lines

Pattern 7 =  $23 + 4 = 27$  lines

Pattern 8 =  $27 + 4 = 31$  lines

Pattern 9 =  $31 + 4 = 35$  lines

Answer \_\_\_\_\_ 35 \_\_\_\_\_ lines

34. The average temperature at a certain location was 22 degrees Celsius for 4 days of the month of June. When one day's temperature was removed from the data, the average temperature remained 22 degrees Celsius. Explain how this is possible. [2]

Answer: The number removed was also 22.

If the mean of the temperatures of four days was 22.

Then the sum of the numbers =  $22 \times 4 = 88$ .

If we remove one number and the mean is still 22, then the new total is  $22 \times 3 = 66$ .

Therefore, the number removed must be  $88 - 66 = 22$ .

35. A company purchased a bulk supply of hardware that contains screws and nails.  
The total weight of the hardware was 18.9 kg.

(a) What was the weight of the screws if the hardware contained 6 kg 650 g of nails? [1]

Weight of screws = Weight of box - Weight of nails

$$= 18.9 \text{ kg} - 6 \text{ kg } 650 \text{ g}$$

$$= 18 \text{ kg } 900 \text{ g} - 6 \text{ kg } 650 \text{ g}$$

$$= 12 \text{ kg } 250 \text{ g}$$

Answer 12 kg 250 g

(b) How many boxes of screws did the company purchase if each box weighs 250 g? [2]

Weight of screws = 12 kg 250 g

$$\text{Number of boxes of screws} = \frac{12\,250}{250}$$

$$= 49$$

Answer 49 boxes



36. The tally chart below shows the favourite part of Christmas by a group of 37 persons.

Favourite part of Christmas	Tally	Frequency
Carols and music		7
Christmas food		9
Decorating the tree		8
Opening presents		13

Complete the tally and frequency for **opening presents**.

[2]

$$\begin{aligned}
 \text{Number of persons who likes opening presents} &= 37 - (7 + 9 + 8) \\
 &= 37 - 24 \\
 &= 13
 \end{aligned}$$

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SECTION III

37. Karishma stocks up on paint brushes, canvases, and paints for her upcoming art class.

(a) Write in the missing pieces of information.

[3]

Item and quantity	Cost
30 paint brushes @ \$25.00 per dozen	(i) \$ _____
8 canvases @ \$42.50 each	(ii) \$ _____
6 paints @ 2 for \$19.90	(iii) \$ _____
<b>Total</b>	<b>\$462.20</b>

(i) 12 paint brushes = \$25.00

Now,  $30 \div 12 = 2.5$  groups

So, 30 paint brushes cost =  $\$25.00 \times 2.5$

= \$62.50

(ii) 1 canvas costs = \$42.50

8 canvases cost =  $\$42.50 \times 8$

= \$340

(iii) 2 paints cost = \$19.90

Now,  $6 \div 2 = 3$  groups

So, 6 paints cost =  $\$19.90 \times 3$

= \$59.70

- (b) A loyalty reward of 20% has been applied to the customer's purchase.  
 What is the final cost after the discount?

[1]

$$\text{Discount} = 20\%$$

$$= \frac{1}{5}$$

$$\begin{aligned} \text{Amount of discount} &= \frac{1}{5} \times \frac{462.20}{1} \\ &= \$92.44 \end{aligned}$$

$$\begin{aligned} \text{Final cost} &= \$462.20 - \$92.44 \\ &= \$369.76 \end{aligned}$$

Answer \$           369.76          

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38. Tim finished a marathon in 75 minutes. Jack finished 17 minutes after Tim and 23 minutes before Sam.

(a) How many minutes did Sam take to complete the marathon? [1]

Tim finished in 75 minutes.

Jack finished 17 minutes after Tim.

Therefore, Jack finished in  $75 + 17 = 92$  minutes.

Jack finished 23 minutes before Sam.

Therefore, Sam finished in  $92 + 23 = 115$  minutes.

Answer \_\_\_\_\_ 115 \_\_\_\_\_ minutes

(b) Tim placed 4<sup>th</sup> in the contest and six participants were between him and Jack. At what position did Jack place? [1]

There are six participants between Tim and Jack.

Therefore,

Tim is 4<sup>th</sup>, so

1<sup>st</sup> student after  $4 + 1 = 5^{\text{th}}$

2<sup>nd</sup> student after  $5 + 1 = 6^{\text{th}}$

3<sup>rd</sup> student after  $6 + 1 = 7^{\text{th}}$

4<sup>th</sup> student after  $7 + 1 = 8^{\text{th}}$

5<sup>th</sup> student after  $8 + 1 = 9^{\text{th}}$

6<sup>th</sup> student after  $9 + 1 = 10^{\text{th}}$

And Jack is  $10 + 1 = 11^{\text{th}}$

Answer \_\_\_\_\_ 11<sup>th</sup> position \_\_\_\_\_

- (c) Tim wants to decrease his time taken by 12% in the next marathon.  
How many minutes should he take to complete the next marathon?

[2]

Tim finished in 75 minutes.

Tim wants to decrease his time taken by 12%.

$$\begin{aligned} \text{Decrease} &= \frac{12}{100} \times 75 \\ &= 9 \text{ minutes} \end{aligned}$$

In the next marathon, Tim should take

= Present time + Expected decrease

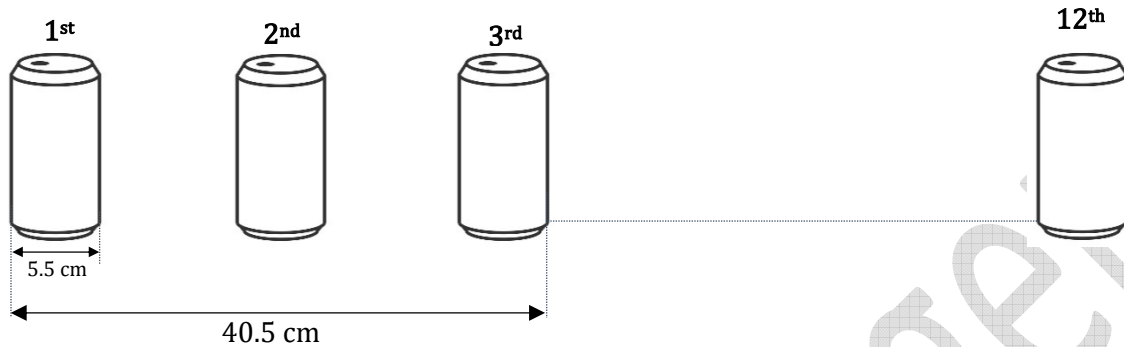
= 75 – 9

= 66 minutes

Answer 66 minutes

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39. An assembly line is producing cans of coke at equal intervals as shown below. The total distance from the first can to the third can is 40.5 cm. Each can has a diameter of 5.5 cm.



What is the total distance from the 2<sup>nd</sup> can of coke to the 12<sup>th</sup> can of coke? [4]

$$\begin{aligned} \text{The space between each can} &= \frac{40.5 - (3 \times 5.5)}{2} \\ &= \frac{40.5 - 16.5}{2} \\ &= \frac{24}{2} \\ &= 12 \text{ cm} \end{aligned}$$

From the 2<sup>nd</sup> to the 12<sup>th</sup> can will have 10 spaces and 11 cans.

$$\begin{aligned} \text{So, the total distance from the 2}^{\text{nd}} \text{ to the 12}^{\text{th}} \text{ can} &= (11 \times 5.5) + (10 \times 12) \\ &= 60.5 + 120 \\ &= 180.5 \text{ cm} \end{aligned}$$

Answer \_\_\_\_\_ **180.5** \_\_\_\_\_ cm

40. A weather report shows the expected temperature for the week, but the information for Tuesday is yet to be determined.

Day	Temperature (°C)
Monday	32
Tuesday	
Wednesday	33
Thursday	27
Friday	30

(a) What is the mean temperature of the four days shown? [2]

$$\begin{aligned} \text{Total temperatures} &= 32 + 33 + 27 + 30 \\ &= 122 \end{aligned}$$

$$\text{Number of days} = 4$$

$$\begin{aligned} \text{Mean} &= 122 \div 4 \\ &= 30.5 \text{ } ^\circ\text{C} \end{aligned}$$

Answer 30.5 °C

(b) The mean of all five days was 31.2 °C. Calculate the expected temperature on Tuesday. [2]

$$\begin{aligned} \text{Total temperatures} &= 31.2 \times 5 \\ &= 156 \end{aligned}$$

$$\begin{aligned} \text{Temperature on Tuesday} &= 156 - 122 \\ &= 34 \end{aligned}$$

Answer 34 °C