

Answer ALL questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

- 1 Write the number three thousand one hundred and seven in figures.

3107

(Total for Question 1 is 1 mark)

- 2 Write $\frac{3}{10}$ as a percentage.

$$3 \div 10 = 0.3$$

$$0.3 \times 100 = 30$$

30

%

(Total for Question 2 is 1 mark)

- 3 Simplify $m + m + m + m$

4m

(Total for Question 3 is 1 mark)

- 4 Change 4000 grams into kilograms.

4

kilograms

(Total for Question 4 is 1 mark)

- 5 7 -5 3 9 -2

Write these numbers in order of size.

Start with the smallest number.

-5 -2 3 7 9

(Total for Question 5 is 1 mark)

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

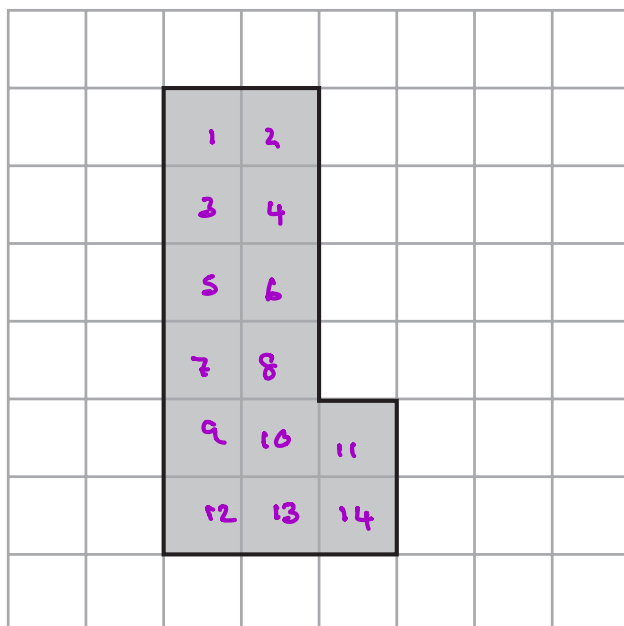


DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

6 The diagram shows a shape on a centimetre grid.



(a) Find the area of the shape.

..... 14 cm²
(1)

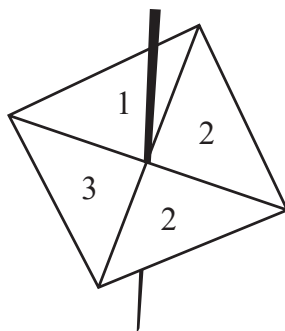
(b) Find the perimeter of the shape.

..... 18 cm
(1)

(Total for Question 6 is 2 marks)



7 Here is a 4-sided spinner.



Samina spins the spinner once.

(a) Choose the word that best describes the probability that the spinner lands on 2

impossible	unlikely	evens	likely	certain
------------	----------	-------	--------	---------

evens

(1)

(b) Choose the word that best describes the probability that the spinner lands on a number less than 4

impossible	unlikely	evens	likely	certain
------------	----------	-------	--------	---------

certain

(1)

Ralph rolls a biased dice once.

The probability that he gets the number 5 is 0.4

(c) Work out the probability that Ralph does **not** get the number 5

$$5 = 0.4$$

$$1 - 0.4 = 0.6$$

0.6

(1)

(Total for Question 7 is 3 marks)



DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

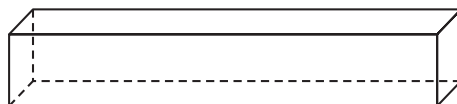
DO NOT WRITE IN THIS AREA

8 A quadrilateral has 4 right angles and 4 sides of equal length.

(a) Write down the mathematical name of this quadrilateral.

square
(1)

The diagram shows a solid shape.



(b) Write down the mathematical name of this shape.

cuboid
(1)

(Total for Question 8 is 2 marks)



9 The table shows the number of books read by four people in one month.

Person	Number of books
Ximena	7
Martha	9
Kezia	1
Tabby	5

(a) Work out the median number of books.

1 5 7 9
↑

6
(2)

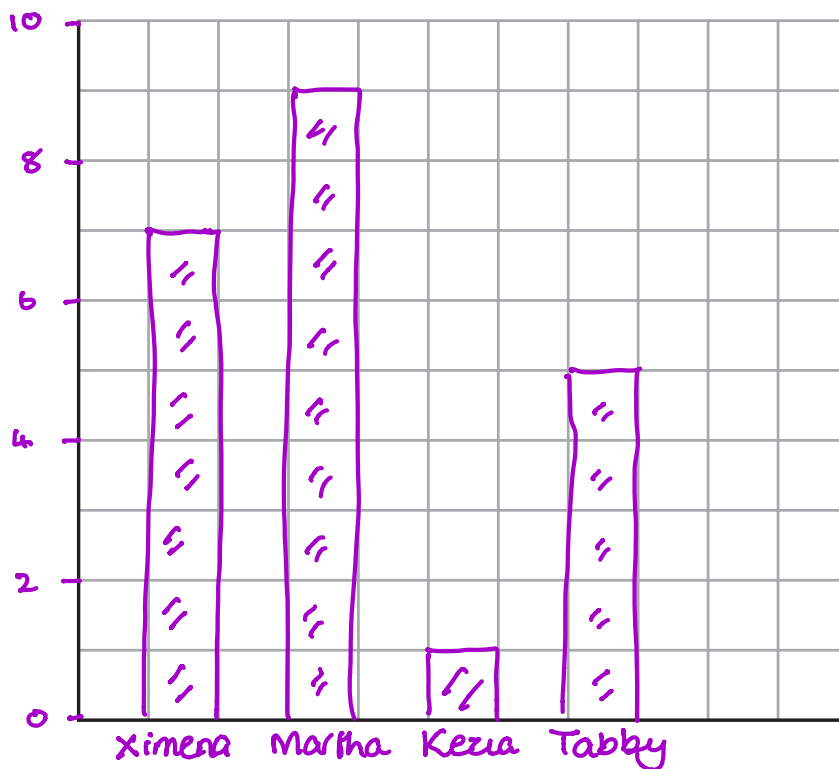
(b) Find the range.

$$9 - 1 = 8$$

8
(1)

(c) On the grid, draw a bar chart to show the information in the table.

Number
of
books



(3)

(Total for Question 9 is 6 marks)



DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

10 Wayne begins walking at 8:30 am.
He walks for 1 hour and 45 minutes.

Wayne then rests for 15 minutes.

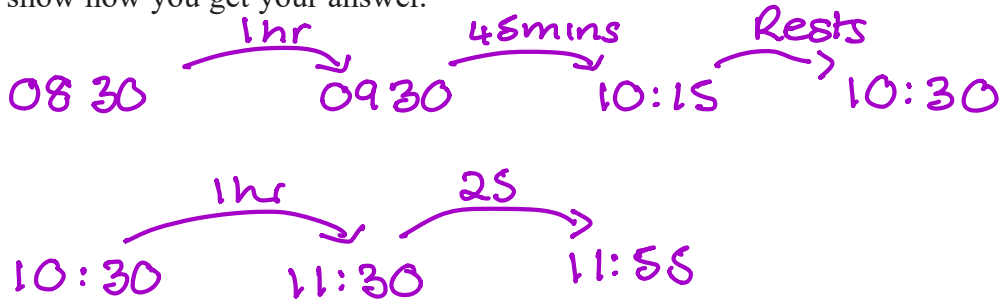
He then walks for 85 minutes to a cafe.

← 1 hr 25 mins

$$\begin{array}{r} 85 \\ -60 \\ \hline 25 \end{array}$$

Does Wayne get to the cafe before 12 noon?

You must show how you get your answer.



Yes he gets there at 11:55
which is before 12 noon

(Total for Question 10 is 4 marks)



P 7 5 1 5 1 A 0 7 2 4

11 Gabriel thinks of a number.

He multiplies his number by 5 and then adds 7
His answer is 72

What number did Gabriel think of?

$$\text{—} \times 5 + 7 = 72$$

$$72 - 7 = 65$$

$$65 \div 5 = 13$$

.....13

(Total for Question 11 is 3 marks)

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA



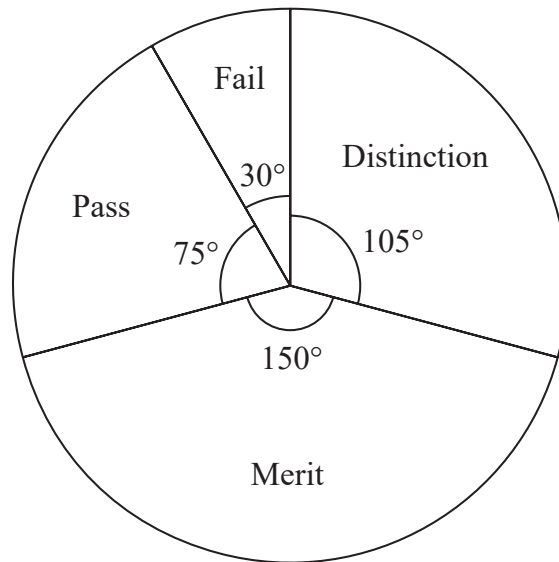
DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

12 Some students took a guitar exam.

The pie chart shows information about the grades the students got.



(a) Write down the modal grade.

merit

(1)

7 students got distinction.

(b) Work out the total number of students who took the guitar exam.

7 students = 105°

÷7

1 student = 15

2 students = 30

24 students = 360

x12

x2

x12

24

(3)

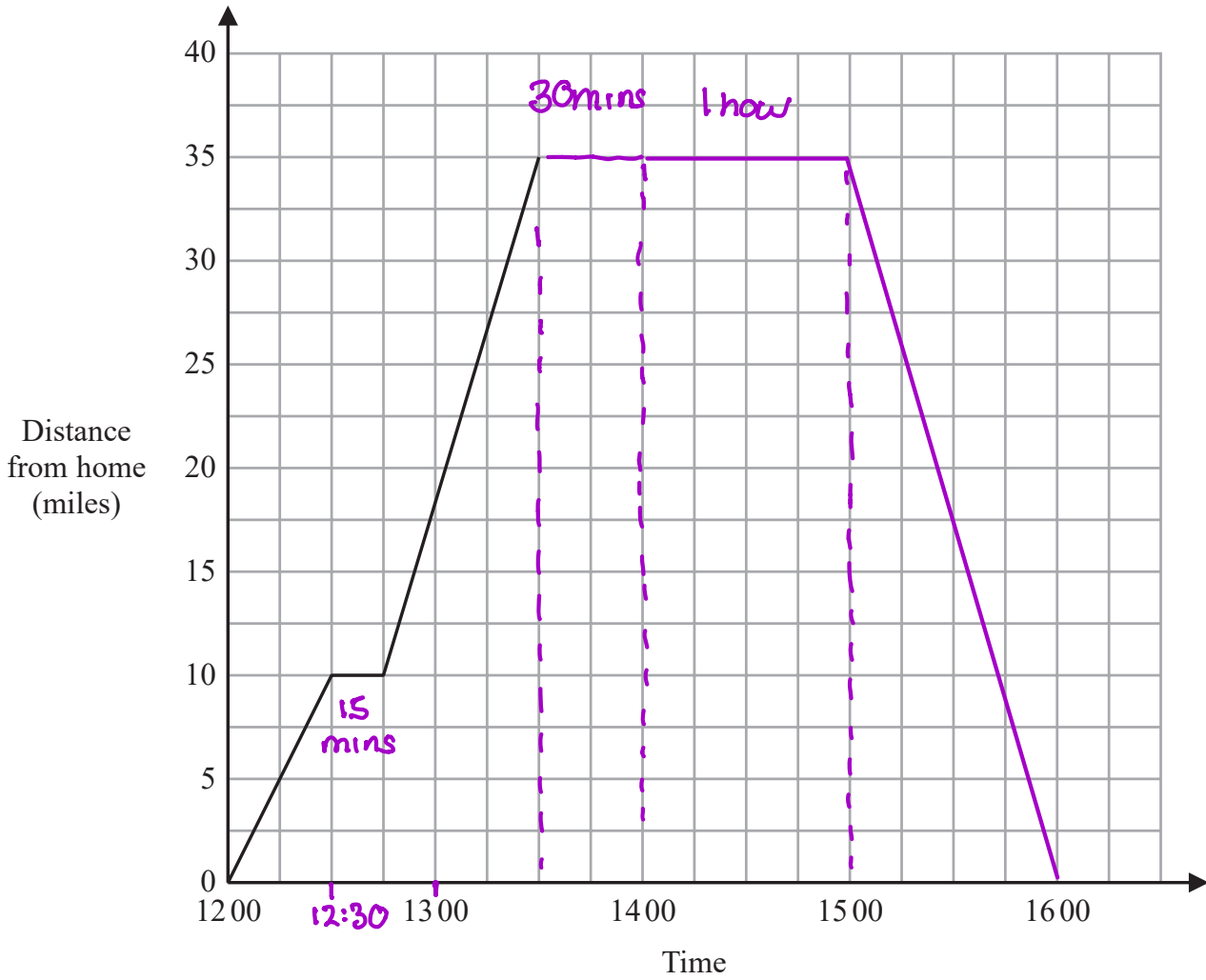
(Total for Question 12 is 4 marks)



P 7 5 1 5 1 A 0 9 2 4

13 Rowena drove from her home to a beach.

Here is a travel graph for her journey.



Rowena stopped at a cafe on her way to the beach.

(a) (i) How many minutes did Rowena take to drive to the cafe?

..... 30 minutes
(1)

(ii) Write down the distance from Rowena's home to the cafe.

..... 10 miles
(1)

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA



DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

Rowena stayed at the beach for $1\frac{1}{2}$ hours.

She then drove home without stopping. ✓
Rowena arrived home at 1600

- (b) On the grid, complete the travel graph. (2)
- (c) Work out the average speed for the journey from the beach to Rowena's home.

1 hour = 35 miles
so speed = 35 miles per hour

..... 35 miles per hour
(1)

(Total for Question 13 is 5 marks)

14 120 boxes cost £6
270 bags cost £10

A bag is cheaper than a box.

How much cheaper?
Give your answer in pence correct to 1 decimal place.

120 boxes = £6

270 bags = £10

1 box = $600 \div 120$
= 5p

1 bag = $1000 \div 270$
= 3.703...p

Difference = $5 - 3.703..$
= 1.296...
= 1.3

..... 1.3p

(Total for Question 14 is 4 marks)



15 There are only red beads and green beads in a bag.

$$\text{number of red beads} : \text{number of green beads} = 1 : 4$$

There are 35 red beads in the bag.

Work out the total number of beads in the bag.

$$\begin{array}{ccc} R & & G \\ 1 & : & 4 \\ \times 35 \downarrow & & \downarrow \times 35 \\ 35 & & 140 \\ \hline \text{Total} & = & 35 + 140 \end{array}$$

175

(Total for Question 15 is 2 marks)

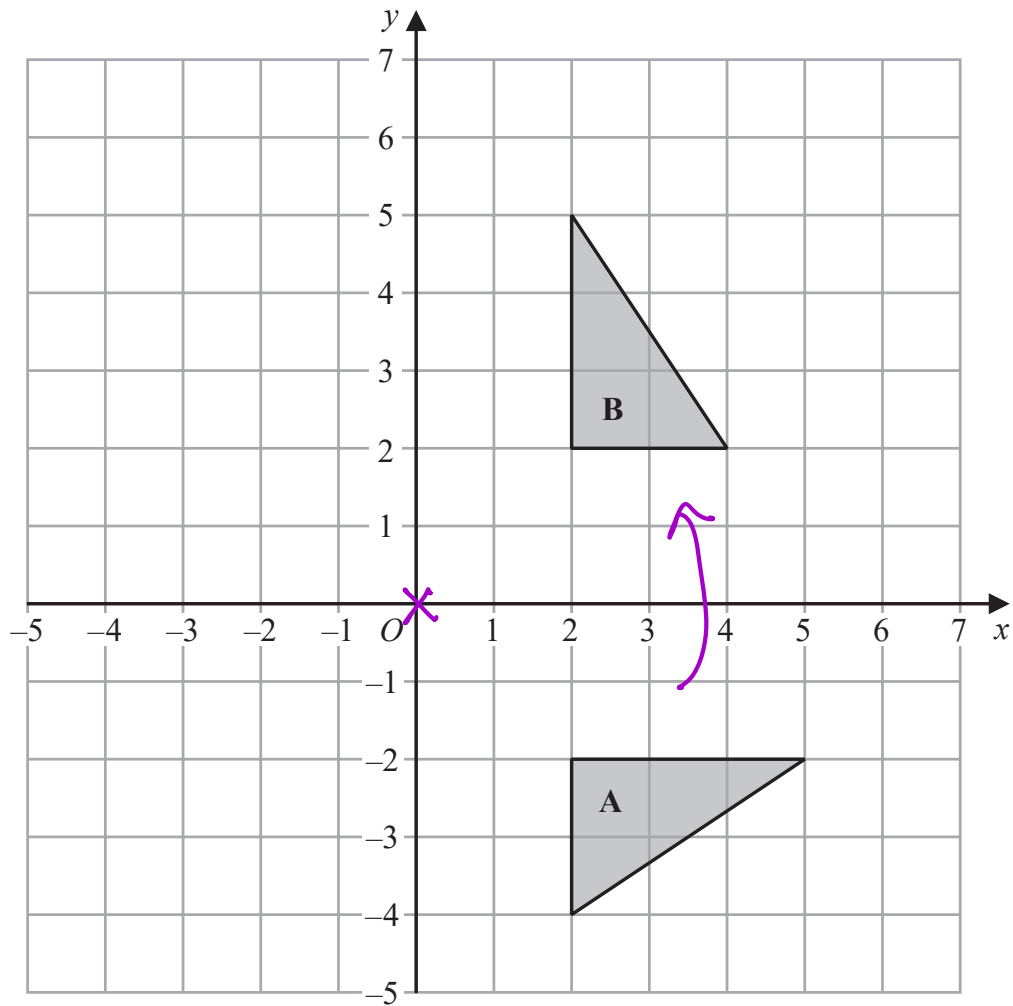
DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA



16



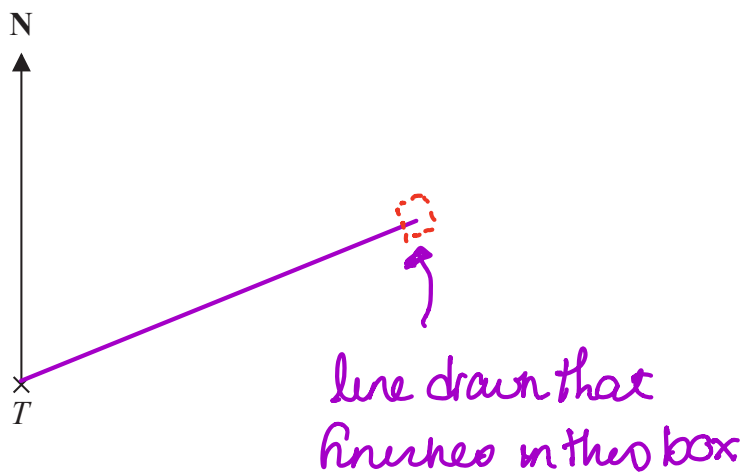
Describe fully the single transformation that maps shape A onto shape B.

Rotation 90° anti-clockwise, centre $(0,0)$

(Total for Question 16 is 2 marks)



17 The diagram shows the position of town T .



Town R is 55 km from town T on a bearing of 065°

Mark the position of town R with a cross (\times).
Use a scale of 1 cm to 10 km.

(Total for Question 17 is 2 marks)

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA



DO NOT WRITE IN THIS AREA

18 Solve $4(2x - 3) = 20$

$$4 \times 2x = 8x$$

$$4x - 3 = -12$$

$$8x - 12 = 20$$

$$+12 \quad +12$$

$$8x = 32$$

$$x = \frac{32}{8}$$

$$x = \dots\dots\dots 4 \dots\dots\dots$$

(Total for Question 18 is 3 marks)

DO NOT WRITE IN THIS AREA

19 Jenny invests £3000 for 6 years at $y\%$ simple interest per year.

At the end of the 6 years, Jenny has received a total of £450 in interest.

Work out the value of y .

$$\text{interest} = 450 \text{ in total}$$

$$6 \text{ years} = 450 \div 6 = 75$$

$$\frac{75}{3000} \times 100 = 2.5$$

$$y = \dots\dots\dots 2.5 \dots\dots\dots$$

(Total for Question 19 is 3 marks)

DO NOT WRITE IN THIS AREA



20 (a) Simplify $(m^2)^3$

$$m^{2 \times 3} = m^6$$

$$\frac{m^6}{\dots\dots\dots}$$

(1)

(b) Simplify $x^5 \times x^8$

$$x^{5+8} = x^{13}$$

$$\frac{x^{13}}{\dots\dots\dots}$$

(1)

(c) Expand $4p(p^2 + 3p)$

$$4p \times p^2 = 4p^3$$

$$4p \times 3p = 12p^2$$

$$\frac{4p^3 + 12p^2}{\dots\dots\dots}$$

(2)

(Total for Question 20 is 4 marks)

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA



DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

21 Jonny wants to know how much coffee he will need for 800 people at a meeting.

Each person who drinks coffee will drink 2 cups of coffee.
10.6 g of coffee is needed for each cup of coffee.

Jonny assumes 68% of the people will drink coffee.

- (a) Using this assumption, work out the amount of coffee Jonny needs.
Give your answer correct to the nearest gram.

$$\begin{aligned}
 &800 \\
 &68\% \text{ of } 800 \\
 &= 0.68 \times 800 \\
 &= 544 \\
 &544 \times 2 = 1088 \text{ cups} \\
 &1088 \times 10.6 = 11532.8 \\
 &= 11533 \text{ (nearest gram)}
 \end{aligned}$$

11533 g
(4)

Jonny's assumption is wrong.
72% of the people will drink coffee.

- (b) How does this affect your answer to part (a)?

My answer would be greater, as he would need more coffee

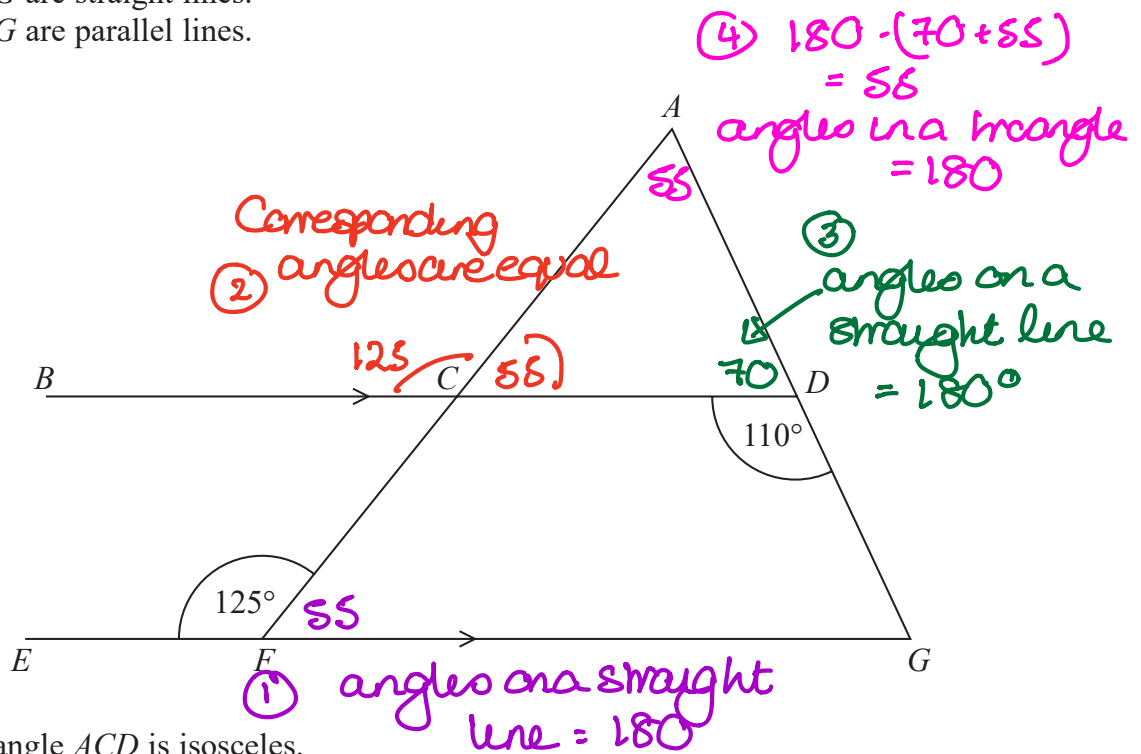
(1)

(Total for Question 21 is 5 marks)



P 7 5 1 5 1 A 0 1 7 2 4

- 22 ACF and ADG are straight lines.
 BCD and EFG are parallel lines.



Show that triangle ACD is isosceles.
 Give a reason for each stage of your working.

The angles in triangle ACD are 55 , 55 and 70
 so the triangle is isosceles, as 2 angles are
 equal

(Total for Question 22 is 5 marks)



DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

23 It takes 14 hours for 5 identical pumps to fill a water tank.

How many hours would it take 4 of these pumps to fill another water tank of the same size?

INVERSE PROPORTION

$$\begin{array}{l}
 \underline{\underline{\times 5}} \downarrow 14 \text{ hours} = 5 \text{ pumps} \\
 \underline{\underline{\div 4}} \downarrow 70 \text{ hours} = 1 \text{ pump} \quad \downarrow \div 5 \\
 \underline{\underline{\div 4}} \downarrow 17.5 = 4 \text{ pumps} \quad \downarrow \times 4
 \end{array}$$

17.5 hours

(Total for Question 23 is 2 marks)



24 A and B are numbers such that

$$A = 2^2 \times 3^4 \times 7$$

$$B = 3^2 \times 7^2$$

(a) Find the highest common factor (HCF) of A and B .

$$\begin{array}{l} A = 2 \times 2 \times \boxed{3} \times \boxed{3} \times 3 \times 3 \times \boxed{7} \\ B = \quad \quad \quad \boxed{3} \times \boxed{3} \quad \quad \quad \times \boxed{7} \times \boxed{7} \end{array}$$

$$\text{HCF} = 3 \times 3 \times 7$$

63

(1)

(b) Find the lowest common multiple (LCM) of A and B .

$$\begin{aligned} \text{LCM} &= 63 \times 2 \times 2 \times 3 \times 3 \times 7 \\ &= 15876 \end{aligned}$$

15876

(2)

(Total for Question 24 is 3 marks)

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA



DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

25 Lava flows from a volcano at a constant rate of $11.9 \text{ m}^3/\text{s}$

How many days does it take for $67\,205\,600 \text{ m}^3$ of lava to flow from the volcano?
Give your answer correct to the nearest day.

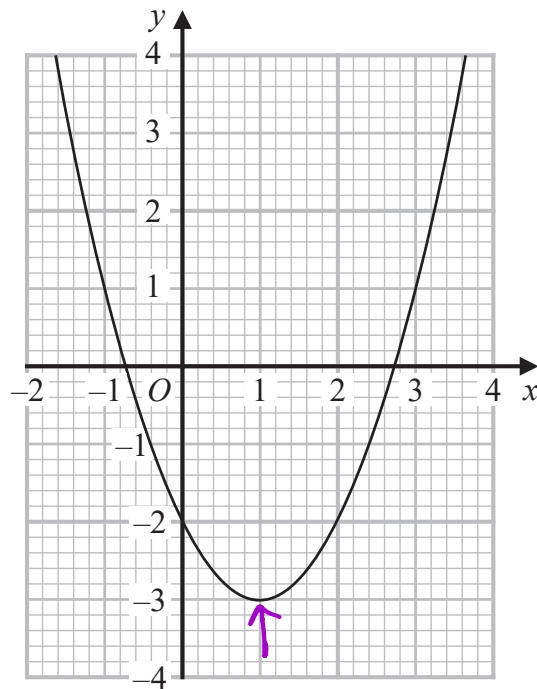
$$\begin{aligned} 67\,205\,600 &\div 11.9 \\ &= 5647529.412 \text{ seconds} \\ &\div 60 = \text{minutes} \\ &\div 60 = \text{hours} \\ &\div 24 = \text{days} \\ &= 68.364 \dots \end{aligned}$$

..... **68** days

(Total for Question 25 is 3 marks)



26 Here is the graph of $y = x^2 - 2x - 2$



(a) Write down the coordinates of the turning point on the graph of $y = x^2 - 2x - 2$

(1, -3)
(1)

(b) Write down an estimate for one of the roots of $x^2 - 2x - 2 = 0$

-0.75 or 2.75
(-0.8 to -0.6) or (2.6 to 2.8)
(1)
(Total for Question 26 is 2 marks)

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA



DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

27 A solid cuboid is made of metal.

The metal has a density of 9 g/cm^3
The volume of the cuboid is 72 cm^3

$$D^m V$$

Work out the mass of the cuboid.

$$\begin{aligned} \text{Mass} &= 9 \times 72 \\ &= 648 \end{aligned}$$

648

g

(Total for Question 27 is 2 marks)

28 (a) Write $(9 \times 10^4) : (4.5 \times 10^6)$ in the form $1 : n$ where n is an integer.

$$\begin{aligned} &\cancel{90000} \quad \cancel{4500000} \\ &9 : 450 \\ &\div 9 \downarrow \quad \div 9 \downarrow \\ &1 : 50 \end{aligned}$$

1 : 50

(2)

(b) Write the following numbers in order of size.
Start with the smallest number.

$$\begin{aligned} &5.625 \times 10^4 \\ &56250 \\ &4 \end{aligned}$$

$$\begin{aligned} &5625 \\ &5625 \\ &3 \end{aligned}$$

$$\begin{aligned} &56.250 \times 10^{-3} \\ &56.250 \\ &1 \end{aligned}$$

$$\begin{aligned} &0.005625 \times 10^5 \\ &562.5 \\ &2 \end{aligned}$$

$$56250 \times 10^{-3} \quad 0.005625 \times 10^5 \quad 5625 \quad 5.625 \times 10^4$$

(2)

(Total for Question 28 is 4 marks)

TOTAL FOR PAPER IS 80 MARKS



P 7 5 1 5 1 A 0 2 3 2 4