Please check the examination details below before entering your candidate information

Candidate surname	Other names

Pearson Edexcel International GCSE

Centre Number | Candidate Number

Thursday 7 January 2021

Morning (Time: 2 hours) | Paper Reference **4MA1/1FR**

Mathematics A

Paper 1FR
Foundation Tier

You must have:
Ruler graduated in centimetres and millimetres, protractor, compasses, pen, HB pencil, eraser, calculator. Tracing paper may be used.

Total Marks

Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions.
- Without sufficient working, correct answers may be awarded no marks.
- Answer the questions in the spaces provided
  – *there may be more space than you need.*
- **Calculators may be used.**
- You must **NOT** write anything on the formulae page.
  Anything you write on the formulae page will gain NO credit.

Information

- The total mark for this paper is 100.
- The marks for **each** question are shown in brackets
  – *use this as a guide as to how much time to spend on each question.*

Advice

- Read each question carefully before you start to answer it.
- Check your answers if you have time at the end.

Turn over ▶

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1/1/1/

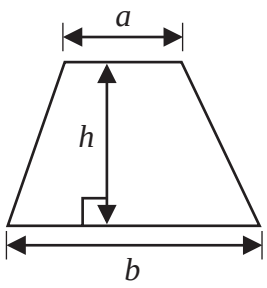
P 6 6 2 9 6 A 0 1 2 4

Pearson

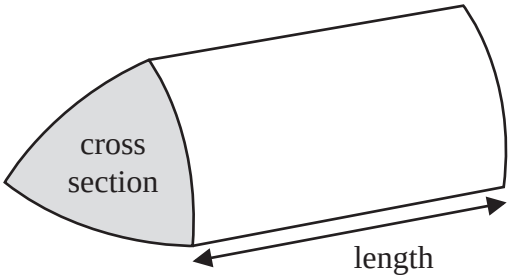
International GCSE Mathematics

Formulae sheet – Foundation Tier

Area of trapezium = $\frac{1}{2}(a + b)h$

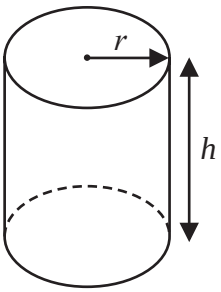


Volume of prism = area of cross section × length



Volume of cylinder = $\pi r^2 h$

Curved surface area of cylinder = $2\pi rh$



Answer ALL TWENTY FIVE questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

1 The table shows the heights, in metres, of five mountains.

Mountain	Height (metres)
Aconcagua	6961
Makalu	8485
Kilimanjaro	5895
Mont Blanc	4810
Puncak Jaya	4884

(a) Which of these mountains has the greatest height?

Makalu (1)

.....

(1)

(b) Write the number 5895 in words.

Five thousand eight hundred and ninety five. (1)

.....

(1)

(c) Write down the value of the 8 in 4810

800 (1)

.....

(1)

(d) Work out the difference between the height of Aconcagua and the height of Puncak Jaya.

6961 - 4884

= 2077

2077 (1) metres

.....

(1)

(Total for Question 1 is 4 marks)

2 Caroline has a bag containing 10 counters.

In the bag there are

7 red counters
2 blue counters
1 green counter

Caroline is going to choose at random a counter from the bag.

impossible	unlikely	evens	likely	certain

(a) Write down the word from the box that best describes the likelihood that Caroline will take

(i) a red counter,

$\frac{7}{10}$

likely (1)

(ii) a yellow counter.

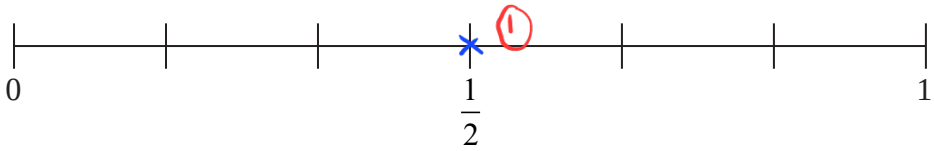
impossible (1)

(2)

Jamil is going to roll a fair six-sided dice.

(b) On the probability scale, mark with a cross (×) the probability that the dice will land on an odd number.

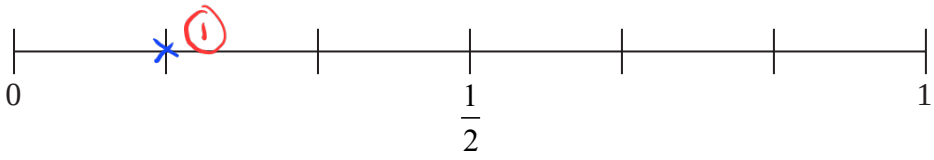
$\frac{3}{6} = \frac{1}{2}$



(1)

(c) On the probability scale, mark with a cross (×) the probability that the dice will land on 2

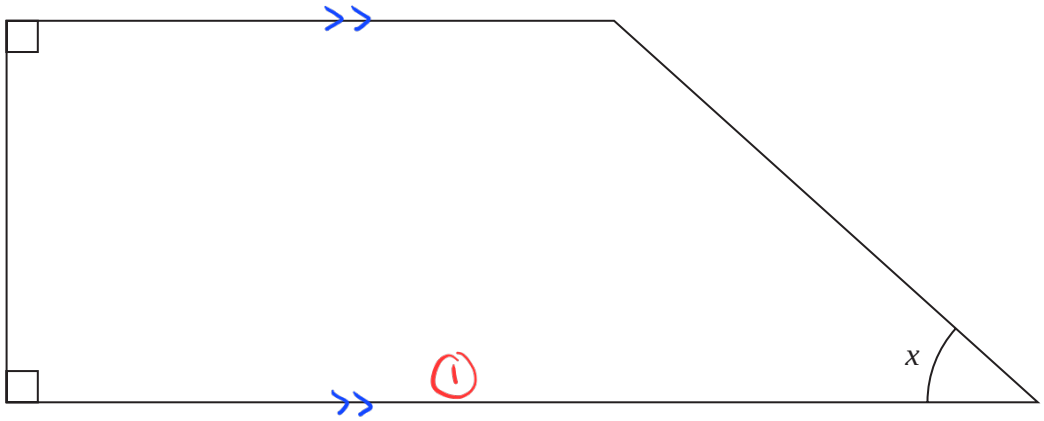
$\frac{1}{6}$



(1)

(Total for Question 2 is 4 marks)

3 Here is a quadrilateral.



(a) What is the mathematical name of this quadrilateral?

Trapezium (1)

(1)

(b) Measure the size of the angle marked *x*.

42 (1) °

(1)

(c) On the quadrilateral, mark with arrows (≫) a pair of parallel lines.

(1)

The quadrilateral has four angles.

(d) How many of these angles are right angles? (90°)

2 (1)

(1)

(Total for Question 3 is 4 marks)

4 Iwan is going to buy the following items

1 plant pot at £8
3 bags of soil at £4.50 for each bag
some packets of seeds at £1.10 for each packet.

Iwan has a total of £30 to spend on these items.
He buys as many packets of seeds as he can.

Work out how much change Iwan should receive.

Finding amount of money Iwan has to buy seeds :

$30 - (8 + 3 \times 4.50)$

$= 30 - 21.50$ (1)

$= 8.50$

Finding no. of packet of seeds he can buy :

$\frac{8.50}{1.10} = 7.72....$

$\therefore$ Iwan can only buy 7 packet of seeds.

$7 \times 1.10 = 7.70$ (1)

Change Iwan should receive :

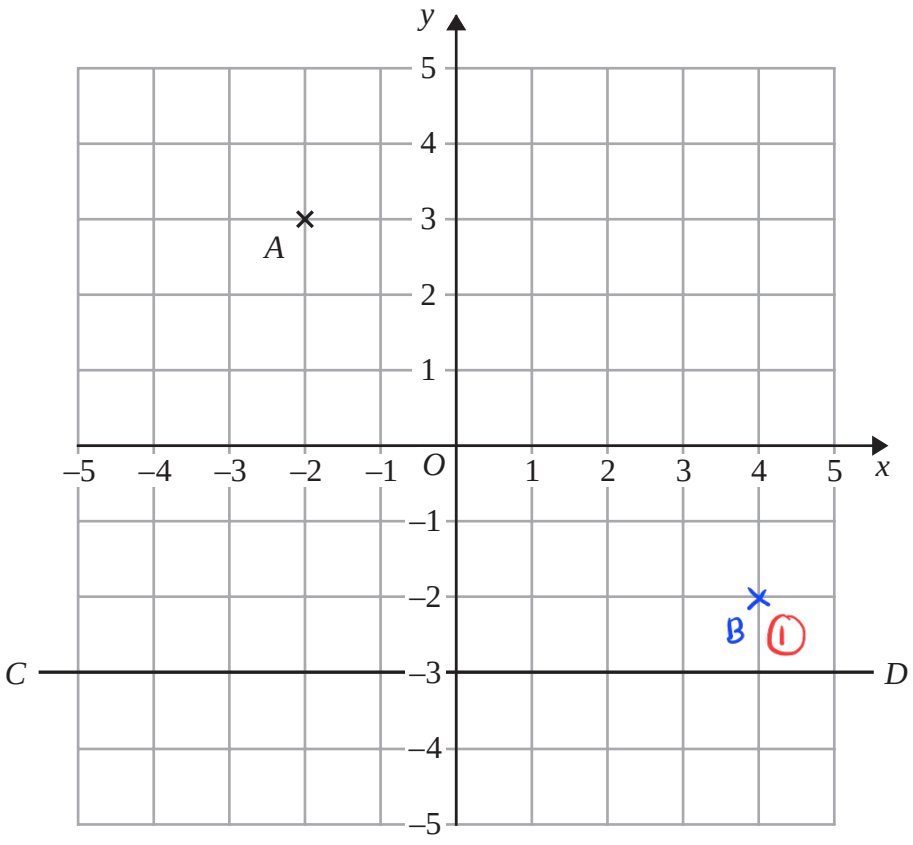
$8.50 - 7.70$ (1)

$= 0.80$ (1)

£ 0.80

(Total for Question 4 is 4 marks)

5 The diagram shows the point A and the line CD on a grid.



(a) Write down the coordinates of point A.

(-2 , 3) (1)

(1)

The point B has coordinates $(4, -2)$

(b) On the grid, mark with a cross (×) the point B.
Label the point B.

(1)

(1)

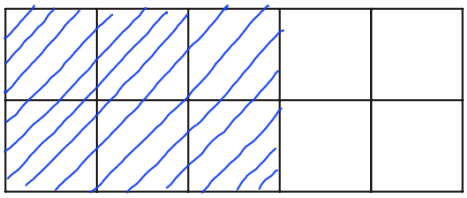
(c) Write down an equation of the line CD.

y = -3 (1)

(1)

(Total for Question 5 is 3 marks)

6 Here is a shape made of squares.



(1)

(a) Shade $\frac{3}{5}$ of the shape.

$\frac{3}{5} \times 10 = 6$

(1)

(b) Write $\frac{36}{120}$ as a fraction in its simplest form.

$\frac{36 \div 12}{120 \div 12} = \frac{3}{10}$

$\frac{3}{10}$ (1)

(1)

(c) Write these fractions in order of size.
Start with the smallest fraction.

$\frac{3}{4} \quad \frac{5}{6} \quad \frac{1}{2} \quad \frac{4}{5}$

convert to decimals:

$\frac{3}{4} = 0.75$ $\quad \frac{1}{2} = 0.5$ (1)

$\frac{5}{6} = 0.833...$ $\quad \frac{4}{5} = 0.8$

$\frac{1}{2}, \frac{3}{4}, \frac{4}{5}, \frac{5}{6}$ (1)

(2)

$\frac{5}{9}$ of a number is 14

(d) What is the number?

$\frac{5}{9} \times N = 14$

$N = \frac{14 \times 9}{5}$ (1)

$= 25.2$ (1)

25.2

(2)

(Total for Question 6 is 6 marks)

7 Cate asked the 60 members of a leisure centre how many times they had each visited the leisure centre last week.

The table gives information about her results.

Number of visits	Frequency
0	4
1	12
2	17
3	20
4	7

(a) Write down the mode of the number of visits.

mode = class with the highest frequency

3 (1)

.....

(1)

Cate is going to draw a pie chart for the information in the table.

(b) Work out the size of the angle in the pie chart for the sector representing 1 visit.

1 visit has 12 frequency.

$\frac{12}{60} \times 360^\circ = 72^\circ$ (1) (1)

72 °

.....

(2)

35% of the 60 members are aged 50 or over.

(c) Work out how many of the members are aged 50 or over.

$\frac{35}{100} \times 60 = 21$ (1) (1)

21

.....

(2)

(Total for Question 7 is 5 marks)

8 (a) Simplify $a \times a \times a \times a$

$a^{1+1+1+1} = a^4$ (1)

a^4

(1)

(b) Simplify $4b \times 5c$

$(4 \times 5) \times b \times c$

$= 20bc$ (1)

$20bc$

(1)

(c) Simplify $6d + 2e + d - 5e$

$6d + d + 2e - 5e$

$= 7d - 3e$ (2)

$7d - 3e$

(2)

(Total for Question 8 is 4 marks)

9 Sabbir has some boxes of bananas and some sacks of tomatoes.
The weight of each box of bananas is the same and the weight of each sack of tomatoes is the same.

The weight of 3 boxes of bananas is 42 kg.
The weight of 8 sacks of tomatoes is 68 kg.

Work out the total weight of 9 boxes of bananas and 15 sacks of tomatoes.

1 box of bananas $= \frac{42\text{ kg}}{3} = 14\text{ kg}$

1 sack of tomatoes $= \frac{68\text{ kg}}{8} = 8.5\text{ kg}$ (1)

Total weight of 9 boxes of bananas and 15 sacks of tomatoes:

$(9 \times 14) + (15 \times 8.5)$

$= 126 + 127.5$ (1)

$= 253.5\text{ kg}$ (1)

253.5 kg

(Total for Question 9 is 3 marks)

10 The diagram shows the isosceles triangle ABC in which $AB = AC$

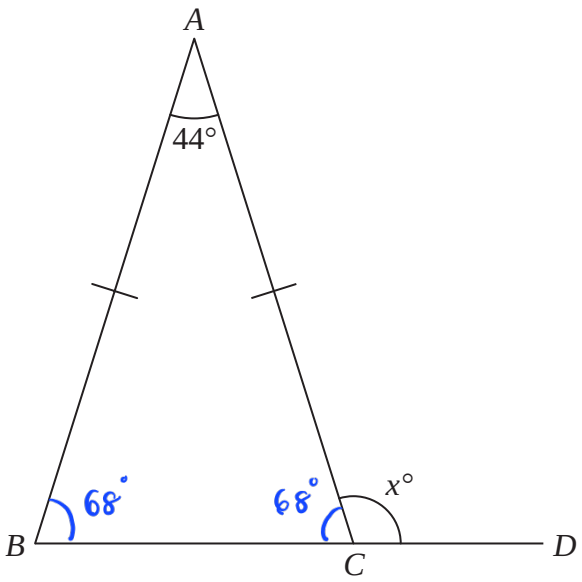


Diagram **NOT** accurately drawn

BCD is a straight line.

Work out the value of x.

angle ABC = angle ACB = $\frac{180^\circ - 44^\circ}{2}$ - base angles of isosceles triangles are the same

$= 68^\circ$ (1)

$x = 180^\circ - 68^\circ$ (1)

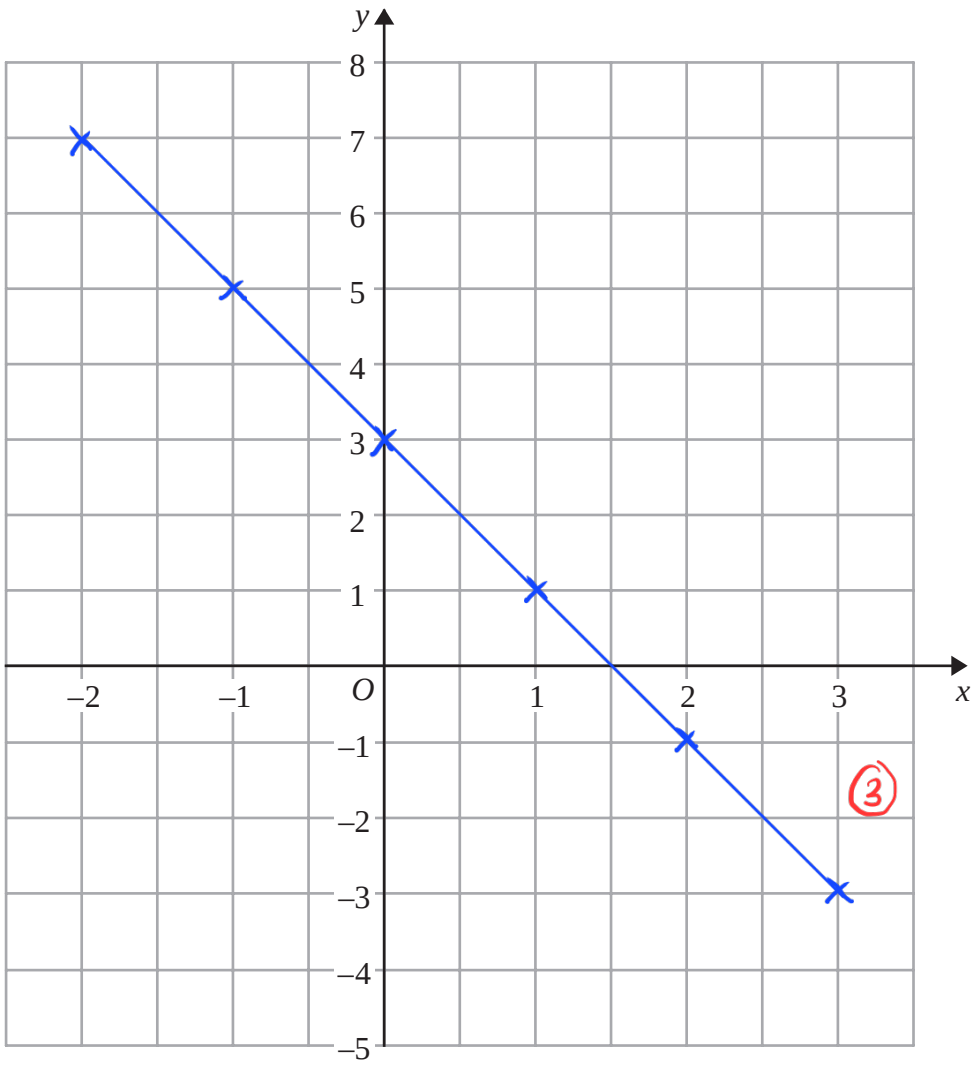
$= 112^\circ$ (1)

$x =$ 112

(Total for Question 10 is 3 marks)

11 On the grid, draw the graph of $y = 3 - 2x$ for values of x from –2 to 3

x	-2	-1	0	1	2	3
y	7	5	3	1	-1	-3



3

(Total for Question 11 is 3 marks)

12 Rose and Haydn share £250 in the ratio 2 : 3

Rose gives all her share of the money to charity.
Haydn gives 42% of his share of the money to charity.

Rose gives more money to charity than Haydn gives to charity.

Work out how much more.

$\frac{250}{2+3} = \frac{250}{5}$

$= 50$ (1)

Rose has : $2 \times 50 = 100$

Haydn has : $3 \times 50 = 150$ (1)

Haydn gives : $\frac{42}{100} \times 150 = 63$ (1)

Rose gives : 100

Difference : $100 - 63$ (1)

$= 37$ (1)

£ 37

(Total for Question 12 is 5 marks)

13 A circle has diameter 18 cm.

Work out the area of the circle.
Give your answer correct to 3 significant figures.

Area of circle : $\pi \times r^2$

$= \pi \times \left(\frac{18}{2}\right)^2$ (1)

$= \pi \times 9^2$

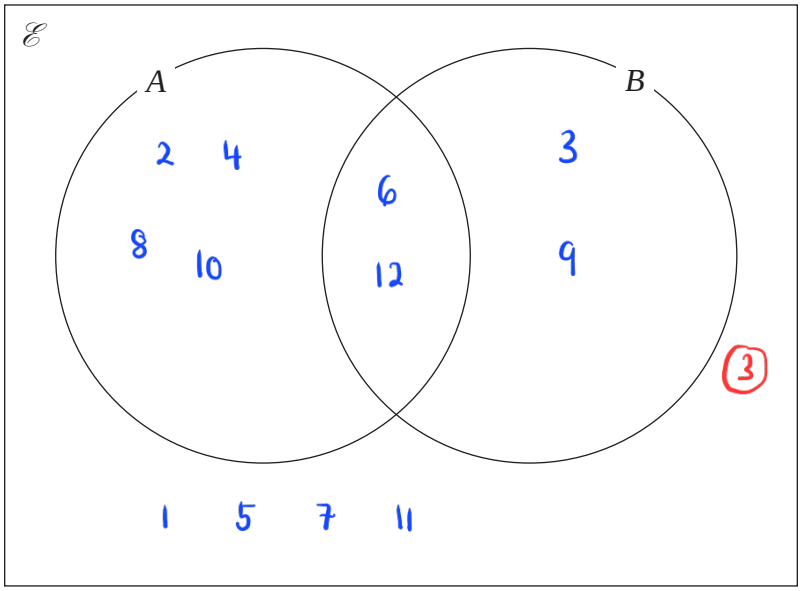
$= 254$ (1)

254 ..... cm^2

(Total for Question 13 is 2 marks)

14 $\mathscr{E} = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12\}$
$A = \{2, 4, 6, 8, 10, 12\}$
$B = \{3, 6, 9, 12\}$

(a) Complete the Venn diagram below for the sets $\mathscr{E}$, A and B.



(3)

One of the numbers in $\mathscr{E}$ is to be chosen at random.

(b) Find the probability that this number is not in set A **and** not in set B.

Total numbers : 12

Numbers not in Set A and not in Set B : 4

$\frac{4}{12}$ (2) .....

(2)

(Total for Question 14 is 5 marks)

15 (a) Expand $5(3a + 4)$

$15a + 20$

$15a + 20$ (1)

(1)

(b) Factorise $4c - 14$

$2(2c - 7)$ (1)

(1)

(c) Solve $5x - 11 = x + 6$
Show clear algebraic working.

$5x - 11 = x + 6$

$5x - x = 6 + 11$ (1)

$4x = 17$ (1)

$x = \frac{17}{4}$

$= 4.25$ (1)

$x =$ 4.25

(3)

(Total for Question 15 is 5 marks)

16 Show that $3\frac{1}{5} \times 1\frac{5}{6} = 5\frac{13}{15}$

LHS : $\frac{\cancel{16}^{8}}{5} \times \frac{11}{\cancel{6}_{3}}$ (1)

$= \frac{8 \times 11}{5 \times 3}$ (1)

$= \frac{88}{15}$ (1)

$= 5\frac{13}{15}$

$15 \overline{)\,88}$ → 5, -75, 13

(Total for Question 16 is 3 marks)

17 Given that $a < b < c$

the four whole numbers a, a, b and c have

a mode of 7
a median of 8.5
a mean of 9

Work out the value of a, the value of b and the value of c.

mode = $a = 7$ (1)

median = $\frac{a+b}{2} = 8.5$

$\frac{7+b}{2} = 8.5$

$7+b = 17$

$b = 10$ (1)

mean = $\frac{a+a+b+c}{4} = 9$ (1)

$7+7+10+c = 36$

$c = 36 - 24 = 12$ (1)

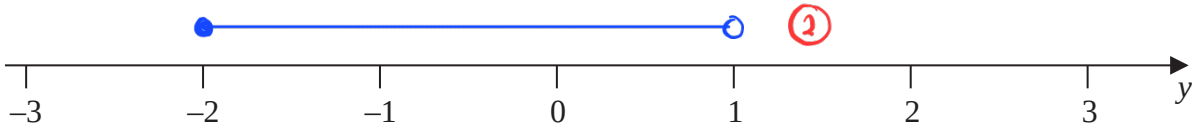
$a =$ 7

$b =$ 10

$c =$ 12

(Total for Question 17 is 4 marks)

18 (a) On the number line, show the inequality $-2 \leqslant y < 1$



(2)

n is an integer. — n is a whole number

(b) Write down all the values of n that satisfy $-3.4 < n \leqslant 2$

-3, -2, -1, 0, 1, 2 (2)

.....

(2)

(Total for Question 18 is 4 marks)

19 A train journey from Paris to Amsterdam took 3 hours 24 minutes.
The total distance the train travelled was 433.5 km.

Work out the average speed of the train.
Give your answer in kilometres per hour.

$$\text{speed} = \frac{\text{distance}}{\text{time}}$$

Convert 24 minutes to hours:

$\frac{24}{60} = 0.4$ hours

time taken = $3 + 0.4 = 3.4$ hours (1)

$$\text{speed} = \frac{433.5 \text{ km}}{3.4 \text{ hours}}$$ (1)

$= 127.5$ km/h (1)

127.5 km/h

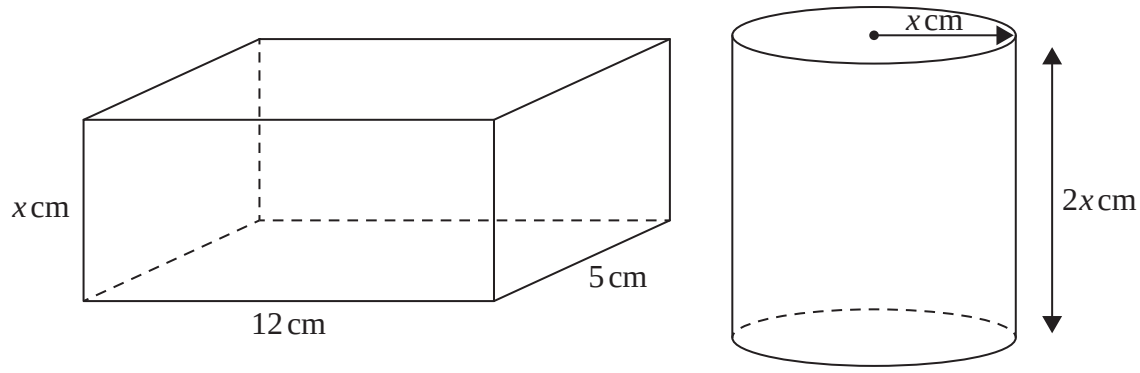
(Total for Question 19 is 3 marks)

20 The diagram shows a cuboid and a cylinder.

Volume of cuboid = $l \times w \times h$

Volume of cylinder = $\pi \times r^2 \times h$

Diagram **NOT** accurately drawn



The dimensions of the cuboid are x cm by 12 cm by 5 cm.
The volume of the cuboid is 270 cm^3

The radius of the cylinder is x cm.
The height of the cylinder is $2x$ cm.

(a) Work out the volume of the cylinder.
Give your answer correct to the nearest whole number.

Volume of cuboid = $12 \times 5 \times x = 270$

$60x = 270$

$x = \frac{270}{60}$

$= 4.5$ cm (1)

Volume of cylinder = $\pi \times x^2 \times 2x$

$= \pi \times (4.5)^2 \times 2(4.5)$ (1)

$= 573$ cm^3 (1)

573 ..... cm^3

(3)

(b) Change 1 m^3 to cm^3

$1\ m^3 \times \frac{(100)^3\ cm^3}{(1)^3\ m^3} = 1\ 000\ 000$ (1)

1 000 000 ..... cm^3

(1)

(Total for Question 20 is 4 marks)

21 (a) Make c the subject of $A = \frac{c}{y} - 5z$

$A = \frac{c}{y} - 5z$) $\times y$

$Ay = c - 5yz$ (1)) $+5yz$

$c = Ay + 5yz$

$c = y(A + 5z)$ (1)

$c = y(A + 5z)$

(2)

(b) Write down the value of g^0

1 (1)

(1)

(c) Factorise $x^2 - 11x + 24$

$x = \frac{11 \pm \sqrt{(-11)^2 - 4(1)(24)}}{2}$ (1)

$= \frac{11 \pm \sqrt{25}}{2}$

$= \frac{11+5}{2}$ or $\frac{11-5}{2}$

$= 8$ or 3

$= (x-8)(x-3)$ (1)

$(x-8)(x-3)$

(2)

(Total for Question 21 is 5 marks)

22 Kuro invests 50 000 yen for 3 years in a savings account.
She gets 2.4% per year compound interest.

Work out how much money Kuro will have in her savings account at the end of the 3 years.
Give your answer correct to the nearest yen.

$100\% + 2.4\% = 102.4\%$

$= 50\,000 \times (102.4\%)^3$ ← compounded for 3 years (2)

$= 53\,687$ (1)

53 687 ..... yen

(Total for Question 22 is 3 marks)

23 The diagram shows a regular pentagon, *ABCDE*, a regular hexagon, *CFGHID*, and a quadrilateral, *EDIJ*.

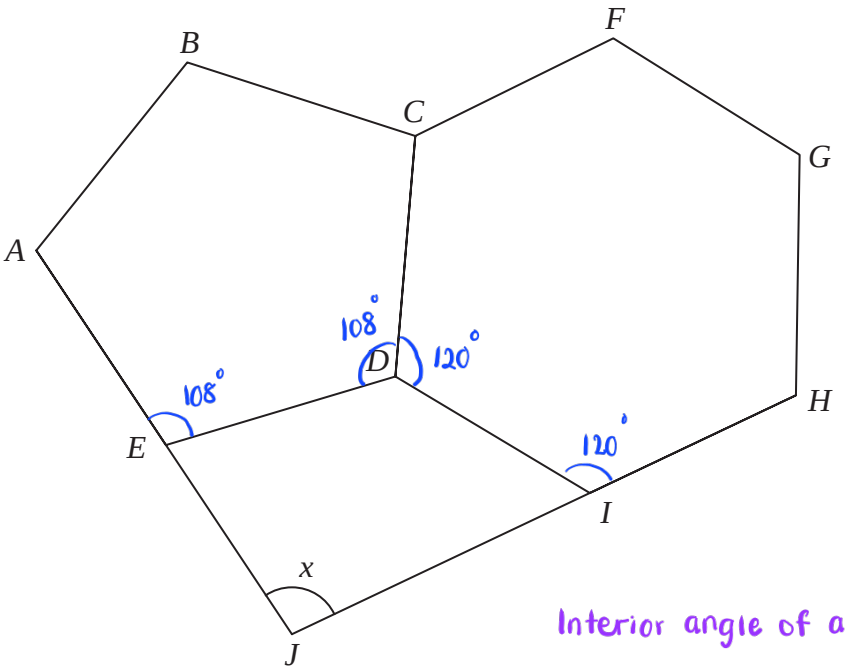


Diagram **NOT** accurately drawn

AEJ and *HIJ* are straight lines.

Work out the size of the angle marked *x*.
Show your working clearly.

Interior angle of a polygon :

$\frac{n-2}{n} \times 180^\circ$

where n = number of sides

Finding interior angle of a Pentagon :

$\frac{5-2}{5} \times 180^\circ = 108^\circ$ (1)

Finding interior angle of a hexagon :

$\frac{6-2}{6} \times 180^\circ = 120^\circ$ (1)

angle JED = $180^\circ - 108^\circ = 72^\circ$

angle EDI = $360^\circ - 108^\circ - 120^\circ = 132^\circ$ (1)

angle DIJ = $180^\circ - 120^\circ = 60^\circ$

$x^\circ = 360^\circ - 72^\circ - 132^\circ - 60^\circ$ (1)

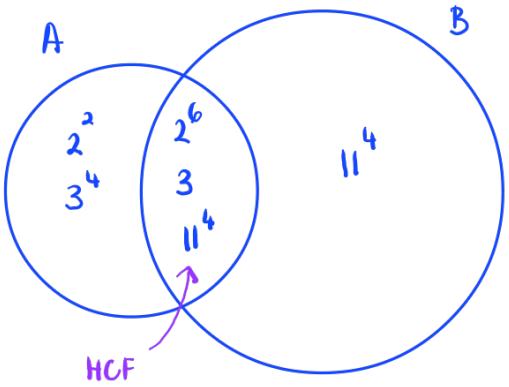
$= 96^\circ$ (1)

96 °

(Total for Question 23 is 5 marks)

24 $A = 2^8 \times 3^5 \times 11^4$ $B = 2^6 \times 3 \times 11^8$

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



HCF of A and B : $2^6 \times 3 \times 11^4$ (2)

$2^6 \times 3 \times 11^4$

(2)

(b) Find the lowest common multiple (LCM) of $2A$ and $3B$.
Give the LCM as a product of powers of its prime factors.

$2A = 2^9 \times 3^5 \times 11^4$

$3B = 2^6 \times 3^2 \times 11^8$

LCM of 2A and 3B : $2^9 \times 3^5 \times 11^8$ (2)

$2^9 \times 3^5 \times 11^8$

(2)

(Total for Question 24 is 4 marks)

25 The diagram shows one face of a wall.
This face is in the shape of a pentagon with exactly one line of symmetry.

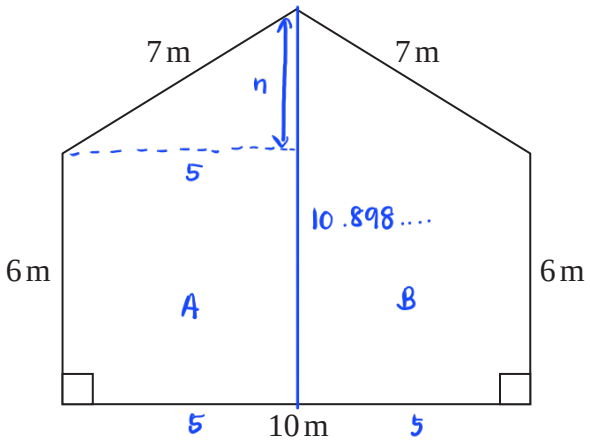


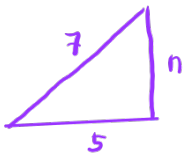
Diagram **NOT** accurately drawn

Omondi is going to paint this face of the wall once.
He has to buy all the paint that he needs to use.

The paint in each tin of paint Omondi is going to buy will cover $16\,m^2$ of the face of the wall.

Work out the least number of tins of paint Omondi will need to buy.
Show your working clearly.

By using Pythagoras' Theorem, finding n :



$n = \sqrt{7^2 - 5^2}$

$= \sqrt{24}$ (1)

$= 4.898....$ (1)

Area of trapezium A and B :

2 trapeziums

$\frac{1}{2} \times (6 + 10.898...) \times (5) \times 2$

$= 84.494..\ m^2$ (1)

$\frac{84.494...}{16} = 5.28$ (1)

5 tins of paint is not enough to cover the whole wall

∴ Omondi needs 6 tins of paint. (1)

6

(Total for Question 25 is 5 marks)

TOTAL FOR PAPER IS 100 MARKS

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