

Please check the examination details below before entering your candidate information

Candidate surname

Other names

**Pearson Edexcel
International GCSE**

Centre Number

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Candidate Number

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Tuesday 21 May 2019

Morning (Time: 2 hours)

Paper Reference **4MA1/1FR**

Mathematics A

Level 1/2

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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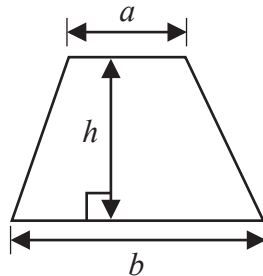
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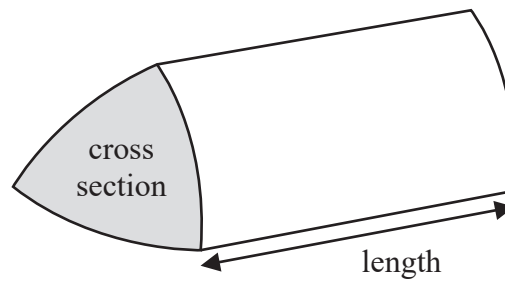

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International GCSE Mathematics
Formulae sheet – Foundation Tier

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

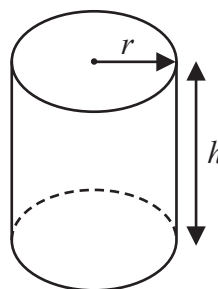


Volume of prism = area of cross section \times length



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

Curved surface area of cylinder = $2\pi r h$



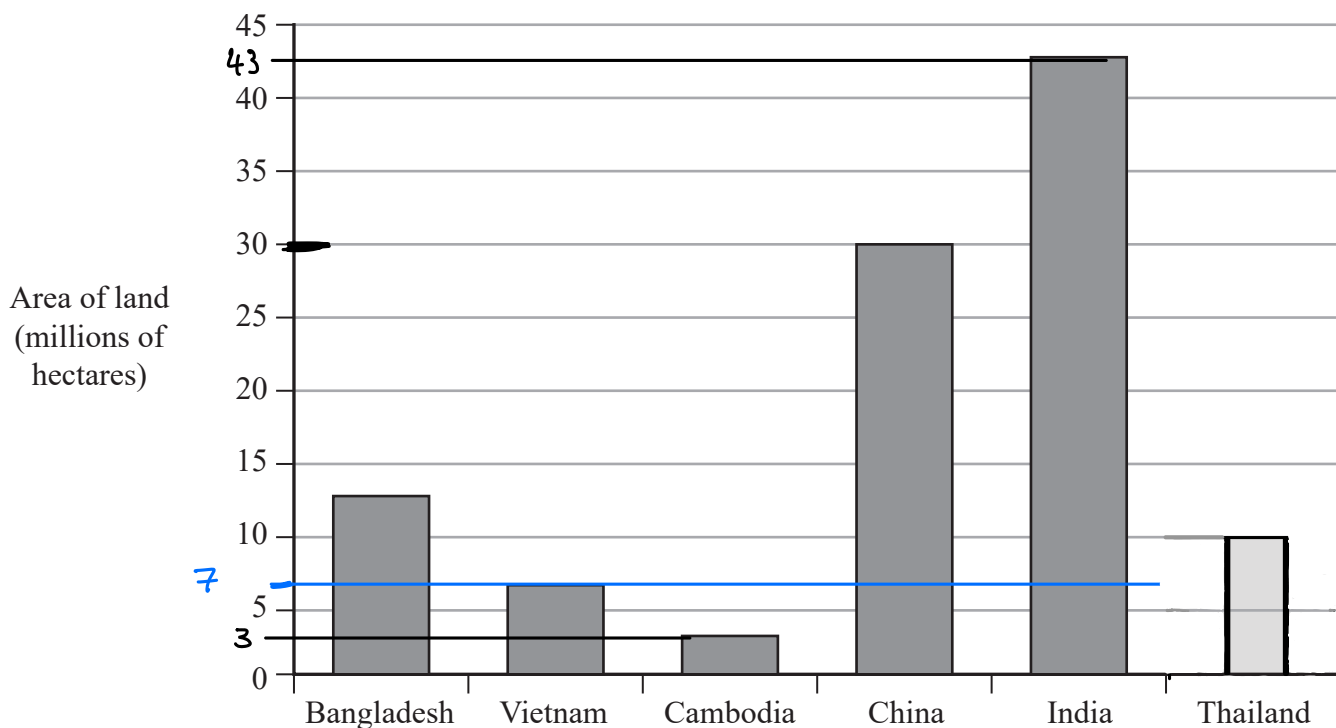
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- 2 The bar chart gives information about the area, in millions of hectares, of the land used in five countries to grow rice.



- (a) In which of these five countries are 7 million hectares of land used to grow rice?

Vietnam

(1)

- (b) How many millions of hectares of land are used to grow rice in China?

30

millions of hectares

(1)

In Thailand 10 million hectares of land are used to grow rice.

- (c) Draw a bar on the bar chart to show this information.

(1)

More land is used to grow rice in India than in Cambodia.

- (d) How many millions of hectares more?
Show your working clearly.

India: 43

Cambodia: 3

$$43 - 3 =$$

40

millions of hectares

(2)

(Total for Question 2 is 5 marks)

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- 3 (a) Write 0.72 as a fraction.
Give your fraction in its simplest form.

$$0.72 = 72 \text{ hundredths}$$

$$= \frac{72}{100} \xrightarrow{\div 4} \frac{18}{25}$$

$$\frac{18}{25}$$

(2)

- (b) Write $\frac{3}{4}$ as a percentage.

$$= \frac{3}{4} \times 100 = 0.75 \times 100 =$$

$$75\%$$

(1)

- (c) Work out 65% of 720

$$65\% \xrightarrow{\div 100} = 0.65$$

$$720 \times 0.65 =$$

$$468$$

(2)

- (d) Write these numbers in order of size.
Start with the smallest number.

0.43

 $\frac{9}{20}$

40.5%

 $\frac{4}{9}$

0.427

0.43

0.45

0.405

0.444...

0.427

③

⑤

①

④

②

40.5%, 0.427, 0.43, $\frac{4}{9}$, $\frac{9}{20}$

(2)

(Total for Question 3 is 7 marks)



P 6 0 2 5 9 A 0 5 2 4

4 Here is a centimetre grid.

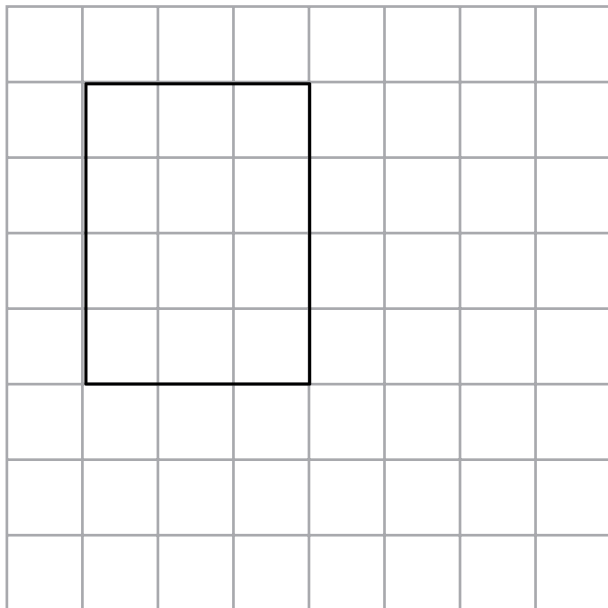
(a) On the grid, draw a rectangle with a perimeter of 14 cm.

$$l = 3$$

$$w = 4$$

$$3 + 3 + 4 + 4$$

$$= 14$$



(2)

Here is a centimetre grid.

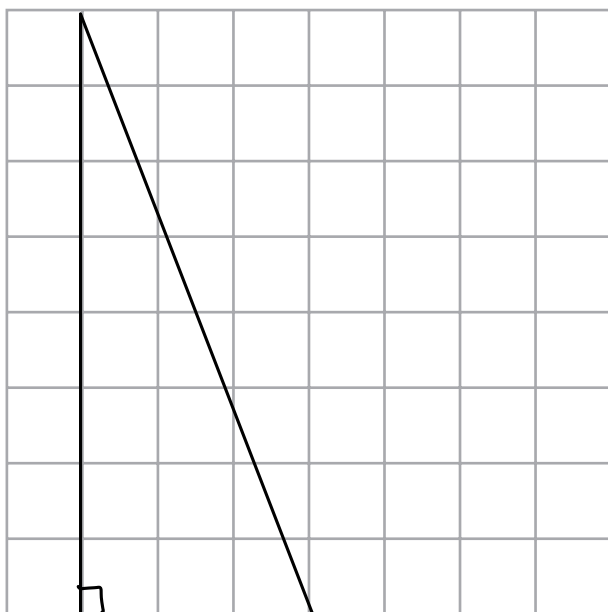
(b) On the grid, draw a right-angled triangle with an area of 12 cm^2

$$\frac{1}{2} \times b \times h = 12$$

$$b \times h = 24$$

$$b = 3 \text{ and}$$

$$h = 8$$



(2)

(Total for Question 4 is 4 marks)

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- 5 The table shows the temperature in each of five Canadian cities one day in January.

City	Temperature
Vancouver	6 °C
Edmonton	-8 °C
Yellowknife	-23 °C
Quebec	-20 °C
Ottawa	-5 °C

- (a) Work out the difference between the temperature in Vancouver and the temperature in Edmonton.

$$6 - (-8) = 6 + 8$$

$$\frac{14}{(1)} \text{ } ^\circ\text{C}$$

The temperature in Yellowknife is lower than the temperature in Ottawa.

- (b) How much lower?

$$\begin{aligned} & -5 - (-23) \\ & = -5 + 23 \end{aligned}$$

$$\frac{18}{(1)} \text{ } ^\circ\text{C}$$

The temperature in Winnipeg was 8 °C greater than the temperature in Quebec.

- (c) Work out the temperature in Winnipeg.

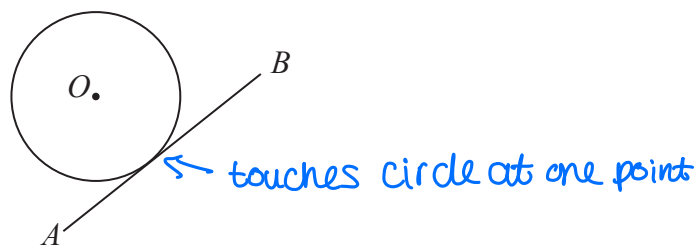
$$-20 + 8 =$$

$$\frac{-12}{(1)} \text{ } ^\circ\text{C}$$

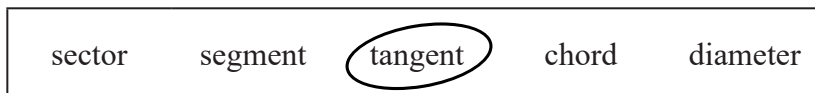
(Total for Question 5 is 3 marks)



- 6 (a) The diagram shows a circle with centre O .

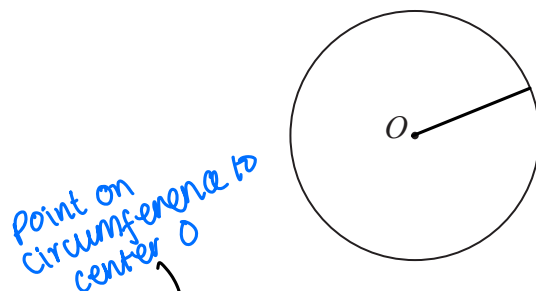


Write down the word from the box that describes the line AB .



tangent
(1)

- (b) The diagram shows a circle with centre O .



On the diagram, draw a radius of the circle.

(1)

- (c)

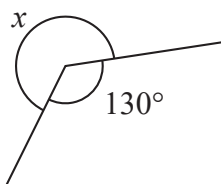


Diagram NOT accurately drawn

Work out the size of the angle marked x .

Angles around a point = 360°

$$x + 130 = 360$$

- 130

$$x = 360 - 130$$

$$= 230$$

230
(1)

(Total for Question 6 is 3 marks)



7 Bella buys

4 packets of sandwiches at £2.40 each packet
 a bottle of water for £1.20
 and 3 packets of crisps.

Bella pays with a £20 note.
 She gets £5.75 change.

Each packet of crisps has the same price.

Work out the price of each packet of crisps.

$$\begin{array}{lcl} \text{Sandwiches cost:} & £2.40 \times 4 & = £9.60 \\ \text{Water} & : £1.20 \times 1 & = £1.20 \\ \text{Crisps} & : £x \times 3 & = £3x \end{array}$$

$$\text{This costs: } \overset{\text{paid}}{20} - \overset{\text{change}}{5.75} = £14.25$$

$$9.60 + 1.20 + 3x = 14.25$$

$$\begin{array}{r} -9.60 \\ -1.20 \\ 3x = 3.45 \end{array}$$

$$\begin{array}{r} \div 3 \\ x = 1.15 \end{array}$$

£ 1.15

(Total for Question 7 is 3 marks)



8 (a) Simplify $a + a + a + a$ ↖ 4 'a's

$$4a$$

(1)

(b) Simplify $3c \times 5c$

$$\begin{array}{l} 5 \times 3 = 15 \\ c \times c = c^2 \end{array}$$

$$15c^2$$

(1)

(c) Simplify $3e + 7g + 5e - 4g$

Add like
terms
separately

$$3e + 5e = 8e$$

$$7g - 4g = 3g$$

$$8e + 3g$$

(2)

(d) Solve $x - 9 = 14$
+9

$$x = 14 + 9$$

$$x = 23$$

(1)

(e) Factorise $5y + 15$ 5 is the highest common factor

$$5(y + 3)$$

$5y \div 5 \quad 15 \div 5$

$$5(y+3)$$

(1)

(f) Make y the subject of $H = 3y - w$

isolate y

$$H = 3y - w$$

$+w$

$$H + w = 3y$$

$\div 3$

$$\frac{H + w}{3} = y$$

$$y = \frac{H + w}{3}$$

(2)

(Total for Question 8 is 8 marks)

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9 A bag of 11 counters contains

- 3 purple counters
- 2 orange counters
- 6 white counters

A counter is going to be taken at random from the bag.

(a) Find the probability that the counter will be

(i) orange

$$\frac{\text{orange}}{\text{total}} = \frac{2}{11}$$

$$\frac{2}{11}$$

(ii) not white

$$\frac{\text{purple} + \text{orange}}{\text{total}} = \frac{3 + 2}{11}$$

$$\frac{5}{11}$$

(iii) green

$$\frac{\text{green}}{\text{total}} = \frac{0}{11} \leftarrow \text{No greens available}$$

$$0$$

(3)

A box of 12 toy cars contains

- 3 red cars
- 4 blue cars
- 5 yellow cars

Some extra red cars are put in the box.

When a car is taken at random from the box, the probability that the car is yellow is $\frac{1}{6}$

(b) Work out the number of extra red cars that are put in the box.

$$P(\text{yellow}) = \frac{5}{\text{total}} = \frac{1}{6}$$

$\xrightarrow{\times 5}$
 $\xleftarrow{\times 5}$

$$\text{Total} = 30 \text{ cars}$$

$$\text{Extra Red: } \underbrace{30}_{\text{Total now}} - \underbrace{12}_{\text{Total before}} =$$

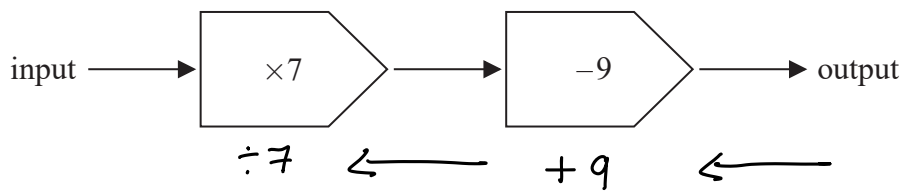
$$18$$

(2)

(Total for Question 9 is 5 marks)



10 Here is a number machine.



(a) Work out the output when the input is 8

$$8 \times 7 = 56$$

$$56 - 9 =$$

$$\begin{array}{r} 47 \\ \hline \end{array}$$

(1)

(b) Work out the input when the output is 82

Do opposite operations in the opposite direction.

$$82 + 9 = 91$$

$$91 \div 7 = 13$$

$$\begin{array}{r} 13 \\ \hline \end{array}$$

(2)

The input is y .

(c) Find an expression, in terms of y , for the output.

$$y \times 7 = 7y$$

$$7y - 9 = \text{output}$$

$$\begin{array}{r} 7y - 9 \\ \hline \end{array}$$

(2)

(Total for Question 10 is 5 marks)

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11 On the grid, draw the graph of $y = 2x - 3$ for values of x from -1 to 5

$$x = -1 : y = 2(-1) - 3$$

$$y = -2 - 3$$

$$y = -5$$

$(-1, -5)$

$$x = 5$$

$$y = 2(5) - 3$$

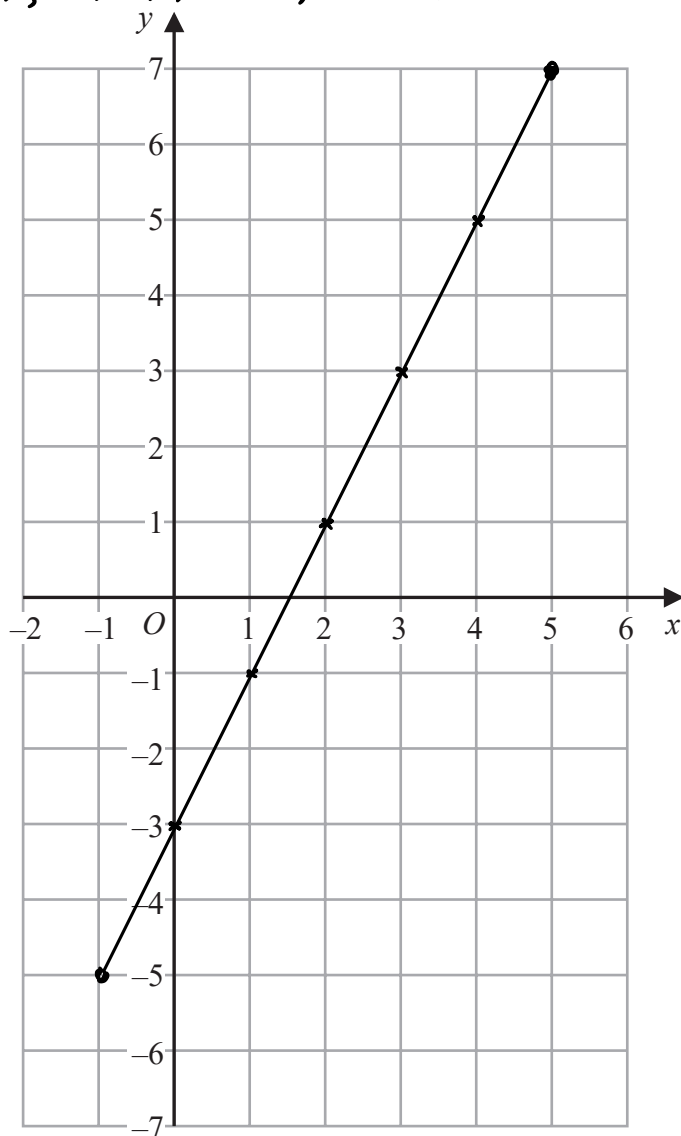
$$y = 10 - 3$$

$$y = 7$$

$(5, 7)$

x	-1	0	1	2	3	4	5
y	-5	-3	-1	1	3	5	7

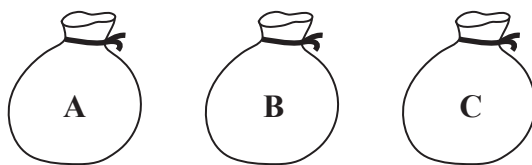
$(-1, -5), (0, -3), (1, -1), (2, 1), (3, 3), (4, 5), (5, 7)$



(Total for Question 11 is 3 marks)



12 Three bags, A, B and C, each contain some marbles.



There is a total of 75 marbles in the three bags.

$\frac{1}{5}$ of the marbles are in bag A.

There are 4 more marbles in bag B than in bag C.

Work out the number of marbles in each bag.

$$A: \frac{1}{5} \text{ of } 75 = 75 \div 5 = 15 \text{ marbles in A}$$

$$B: x + 4$$

$$C: x$$

$$\text{marbles left: } 75 - 15 = 60 \quad \leftarrow \text{B+C}$$

$$x + x + 4 = 60$$

$$\text{collect like terms } 2x + 4 = 60$$

$$2x = 56$$

$$\text{bag C} \rightarrow x \stackrel{\div 2}{=} 28$$

$$\text{Bag B: } x + 4 = 28 + 4 = 32$$

$$\text{Bag A} \dots 15$$

$$\text{Bag B} \dots 32$$

$$\text{Bag C} \dots 28$$

(Total for Question 12 is 3 marks)

13 Potatoes cost 2 dollars per kg.

Carrots cost 3 dollars per kg.

Alfred buys p kg of potatoes and c kg of carrots.

The total cost is T dollars.

Write down a formula for T in terms of p and c .

$$T = 2 \times p + 3 \times c$$

2 dollars
 p kg of potatoes
3 dollars
 c kg of carrots

$$T = 2p + 3c$$

(Total for Question 13 is 3 marks)

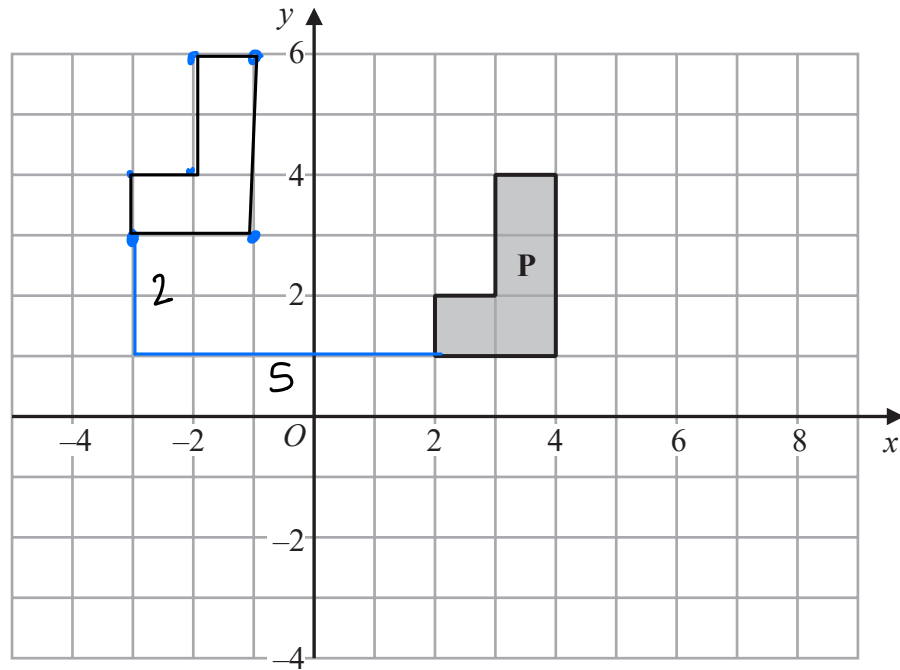
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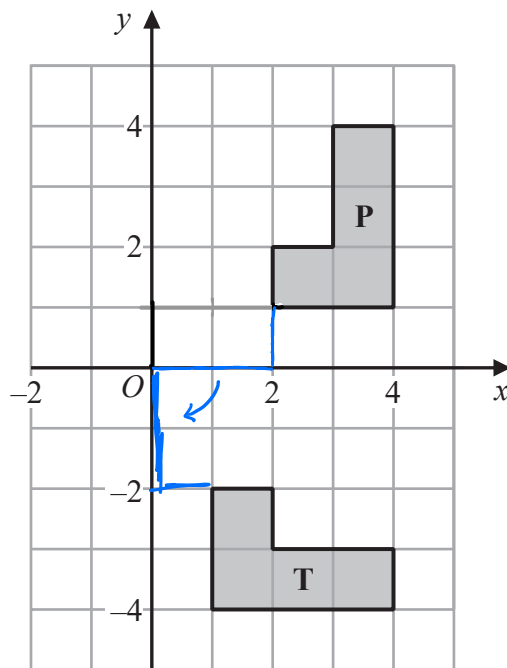
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14



- (a) On the grid above, translate shape **P** by the vector $\begin{pmatrix} -5 \\ 2 \end{pmatrix}$ *5 left
2 up* (1)



- (b) Describe fully the single transformation that maps shape **P** onto shape **T**.

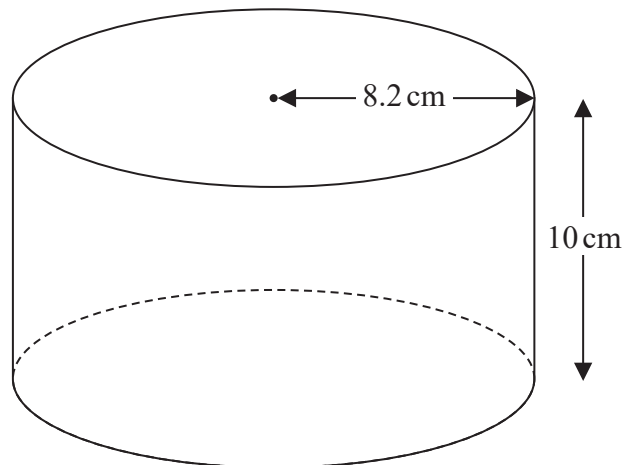
Rotation 90° clockwise about (0,0)

(3)

(Total for Question 14 is 4 marks)



15 The diagram shows a cylinder.



The cylinder has radius 8.2 cm and height 10 cm.

The cylinder is empty.

$$1 \text{ mL} = 1 \text{ cm}^3$$

Pam pours 1.5 litres of water into the cylinder.

Work out the depth of the water in the cylinder.

Give your answer correct to 1 decimal place.

$$1.5 \text{ l} \stackrel{\times 1000}{=} 1500 \text{ mL} = 1500 \text{ cm}^3$$

Area of circle
base :

$$\pi \times 8.2^2 = 211.24... \text{ cm}^2$$

Depth :

$$\begin{aligned} & \text{Volume} \div \text{Base area} \\ & 1500 \text{ cm}^3 \div 211.24... \text{ cm}^2 \\ & = 7.1009... \text{ cm} \\ & \quad \text{round down} \end{aligned}$$

..... 7.1 cm

(Total for Question 15 is 3 marks)

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16 Each interior angle of a regular polygon is 162°

Work out the number of sides the polygon has.

$$\text{Interior} + \text{Exterior} = 180$$

$$\text{Exterior} = \frac{360}{n} \quad \leftarrow \text{no. of sides}$$

$$162 + x = 180 \quad (\text{angles in a straight line add up to } 180)$$

$$x = \frac{-162}{1} = 18^\circ$$

$$18 = \frac{360}{n}$$

$$18n = 360$$

$$n = 20$$

..... 20 sides

(Total for Question 16 is 3 marks)

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$$17 \quad \mathcal{E} = \{11, 12, 13, 14, 15, 16, 17, 18, 19, 20\}$$

$$A = \{\text{even numbers}\}$$

$$B = \{\text{multiples of 3}\}$$

List the members of the set

(i) $A \cap B$ \leftarrow in List A and B
 \hookrightarrow even multiples of 3

12, 18

(ii) $A \cup B$
 even or multiples of 3

12, 14, 15, 16, 18, 20

(iii) A' — not A
 \hookrightarrow not even

11, 13, 15, 17, 19

(Total for Question 17 is 3 marks)

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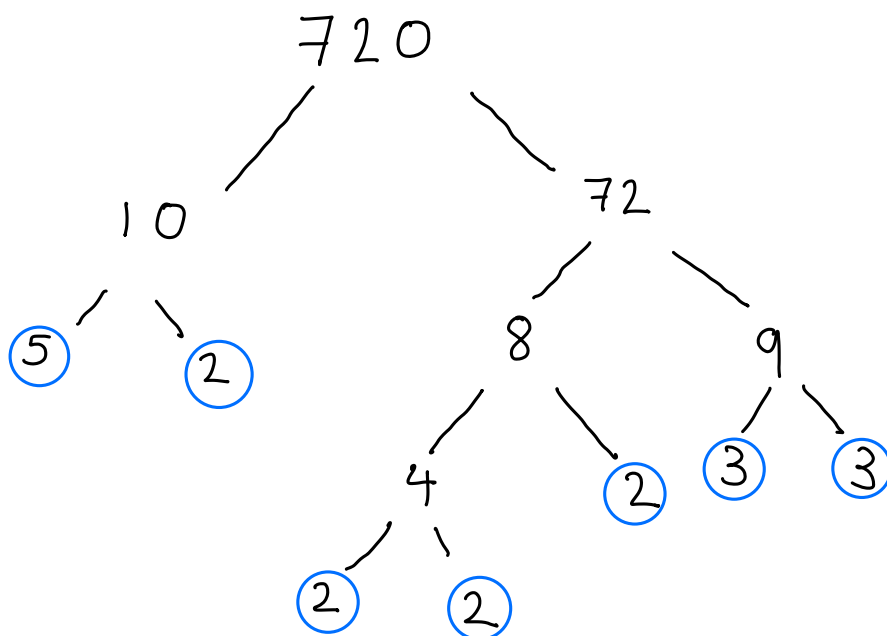
18 (a) Find the highest common factor (HCF) of 21 and 35

Factors of 21 : 1, 3, 7, 21

35 : 1, 5, 7, 35

7
(1)

(b) Write 720 as a product of its prime factors.
Show your working clearly.



$$= 2 \times 2 \times 2 \times 2 \times 3 \times 3 \times 5$$

$$= 2^4 \times 3^2 \times 5$$

(3)

(c) Find the smallest whole number that 720 can be multiplied by to give a square number.

To be square, all prime factor products must be square.

$$2^4 = 16 \text{ - square}$$

$$3^2 = 9 \text{ - square}$$

$$5 = \text{not square}$$

To make 720 a square,
x by 5

$$5 \times 5 = \text{square}$$

5
(1)

(Total for Question 18 is 5 marks)



19 Lorenzo increases all the prices on his restaurant menu by 8%

Before the increase, the price of a dessert was \$4.25

(a) Work out the price of the dessert after the increase.

$$\text{Multiplier: } 100 + 8 = 108\% \div 100 = 1.08$$

$$\begin{array}{ccc} 4.25 & \times & 1.08 = 4.59 \\ \text{before} & & \text{multiplier} \end{array}$$

\$ 4.59
(3)

After the increase, the price of lasagne is \$9.45

(b) Work out the price of lasagne before the increase.

$$x = \text{price before}$$

$$\begin{array}{l} 1.08x = 9.45 \\ \text{multiplier} \quad \quad \quad \div 1.08 \\ x = 8.75 \end{array}$$

\$ 8.75
(3)

(Total for Question 19 is 6 marks)

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20 The diagram shows isosceles triangle ABC .

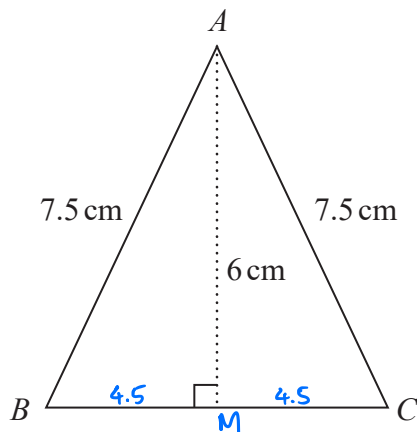


Diagram NOT
accurately drawn

$AB = AC = 7.5$ cm.

The height of the triangle is 6 cm.

Calculate the area of the triangle.

Pythagoras : $a^2 + b^2 = c^2$
theorem

$$\text{Area} = \frac{1}{2} \times \text{base} \times \text{perpendicular height}$$

Base :

$$\begin{aligned} (BM)^2 + (AM)^2 &= (AB)^2 \\ (BM)^2 &= (7.5)^2 - 6^2 \\ &= 20.25 \\ BM &= \sqrt{20.25} \\ &= 4.5 \end{aligned}$$

$$BM = MC$$

$$\therefore BC = 4.5 + 4.5 = 9 \text{ cm}$$

$$\text{Area} = \frac{1}{2} \times 9 \times 6 =$$

..... 27 cm^2

(Total for Question 20 is 4 marks)



- 21 There are 10 people in a lift.
These 10 people have a mean weight of 79.2 kg. ①

$$\text{Mean} = \frac{\text{Total sum}}{\text{Total number}}$$

- 3 of these people get out of the lift.
These 3 people have a mean weight of 68 kg. ②

Work out the mean weight of the 7 people left in the lift.

$$\textcircled{1} \quad 79.2 = \frac{\text{Total sum}}{10}$$

$$792 \text{ kg} = \text{Total sum of 10 people}$$

$$\textcircled{2} \quad 68 = \frac{\text{Total sum}}{3}$$

$$204 = \text{Total sum of 3 people}$$

$$\text{Total sum of 7: } 792 - 204 = 588$$

$$\text{mean: } \frac{588}{7}$$

84 kg

(Total for Question 21 is 3 marks)

- 22 (a) Simplify $t^9 \div t^3$

$$a^b \div a^c = a^{b-c}$$

$$= t^{9-3}$$

$$t^6$$

(1)

- (b) Simplify $w^5 \times w^7$

$$a^b \times a^c = a^{b+c}$$

$$= w^{5+7}$$

$$w^{12}$$

(1)

- (c) Simplify $(5xy^2)^3$

$$= 5^3 \times x^3 \times y^{2 \times 3}$$

$$(a^b)^c = a^{b \times c}$$

$$125 x^3 y^6$$

(2)

(Total for Question 22 is 4 marks)

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- 23 Change 22 metres per second to a speed in kilometres per hour.
Show your working clearly.

$$\frac{22 \text{ m}}{1 \text{ sec}} \times \frac{1 \text{ km}}{1000 \text{ m}} \times \frac{1 \text{ sec}}{1/3600}$$

i.e.

$$\begin{aligned} 22 \text{ m} &\rightarrow 1 \text{ sec} \\ 79200 \text{ m} &\rightarrow 3600 \text{ sec} \end{aligned} \quad \times 3600$$

1h = 60 × 60
min sec

$$79200 \text{ m} = \frac{79200}{1000} \text{ km} = 79.2 \text{ km}$$

$$1 \text{ second} = \frac{1}{60} \text{ min} = \frac{1}{3600} \text{ hour}$$

÷60 ÷60

$$\begin{aligned} \frac{22 \text{ m}}{1 \text{ sec}} \times \frac{1 \text{ km}}{1000 \text{ m}} \times \frac{3600 \text{ sec}}{1 \text{ hour}} \\ = \frac{79200 \text{ km}}{1000 \text{ h}} = \dots\dots\dots 79.2 \dots\dots\dots \text{ km/h} \end{aligned}$$

(Total for Question 23 is 3 marks)

- 24 3 years ago, the ratio of Tom's age to Clemmie's age was 2 : 7
Tom is now 15 years old and Clemmie is now x years old.

Find the value of x .

3 years ago: Tom was $15 - 3 = 12$

Ratio

$$\begin{array}{l} T : C \\ 2 : 7 \\ \times 6 \quad \left(\begin{array}{l} \rightarrow 12 : 42 \end{array} \right) \times 6 \end{array}$$

3 years ago Clemmie was 42.

Now : $42 + 3$

$$x = \dots\dots\dots 45 \dots\dots\dots$$

(Total for Question 24 is 3 marks)



25

$$\text{pressure} = \frac{\text{force}}{\text{area}}$$

A box, in the shape of a cuboid, is going to be put on a table.

The whole of one face of the box will be in contact with the table.

The force exerted by the box on the table is always 105 newtons.

The box is 5 m by 4 m by 3 m.

The greatest pressure exerted by the box on the table is P newtons/m²

The least pressure exerted by the box on the table is Q newtons/m²

Work out the value of $P - Q$

Areas:

$$\begin{aligned} 5 \times 4 &= 20 \text{ m}^2 \\ 5 \times 3 &= 15 \text{ m}^2 \\ 4 \times 3 &= 12 \text{ m}^2 \end{aligned}$$

Greatest Pressure: $\frac{105}{\text{smallest surface area}}$

$$= \frac{105}{12} = 8.75 = P$$

Least Pressure: $\frac{105}{\text{largest area}}$

$$= \frac{105}{20} = 5.25 = Q$$

$$\begin{aligned} P - Q &= 8.75 - 5.25 \\ &= 3.5 \end{aligned}$$

3.5

(Total for Question 25 is 3 marks)

TOTAL FOR PAPER IS 100 MARKS

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