

Write your name here

Surname

Other names

**Pearson Edexcel
International GCSE**

Centre Number

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Candidate Number

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Mathematics A model answers

Level 1/2 Paper 1F

**Foundation Tier**

Sample assessment material for first teaching September 2016

Time: 2 hours

Paper Reference

4MA1/1F**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

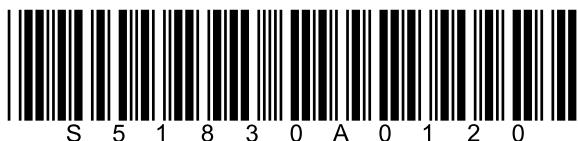
- The total mark for this paper is 100.
- The marks for **each** question are shown in brackets
– *use this as a guide as to how much time to spend on each question.*

Advice

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

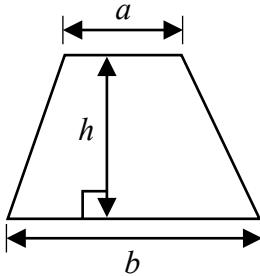
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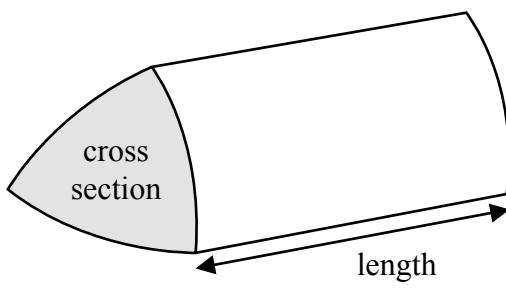
**PEARSON**

International GCSE Mathematics
Formulae sheet – Foundation Tier

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

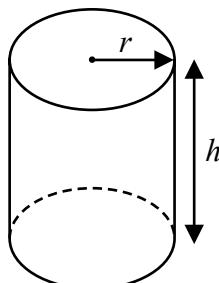


Volume of prism = area of cross section \times length



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

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



DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

Answer ALL TWENTY FIVE questions.**Write your answers in the spaces provided.****You must write down all stages in your working.**

- 1** Here is a list of numbers.

2 8 15 24 31 36 40 64

From this list, write down

- (a) an odd number

↓
not a multiple of 2

.....
(1)

- (b) a multiple of 6

$$6 \times 4 = 24$$

.....
(1)

$$6 \times 6 = 36$$

- (c) a square number

$$6^2 = 36$$

.....
(1)

$$8^2 = 64$$

- (d) a prime number

↓ factors of only one and itself

.....
(1)

(Total for Question 1 is 4 marks)

- 2** (a) Write 64% as a fraction.

Give your fraction in its simplest form.

$$64\% = \frac{64}{100} = \frac{16}{25}$$

.....
(2)

- (b) Write 9% as a decimal.

$$9\% = \frac{9}{100} = 0.09 \quad \text{9 hundredths}$$

.....
(1)

- (c) Work out $\frac{1}{6}$ of 84 kg.

$$\frac{1}{6} \times 84 \text{ kg} = 14 \text{ kg}$$

.....
(1)

(Total for Question 2 is 4 marks)

- 3 The pictogram shows some information about the number of calculators sold in a shop on each of five days.

Monday				
Tuesday				
Wednesday				
Thursday				
Friday				

- (a) On which day did the shop sell the greatest number of calculators?

.....
Thursday
(1)

The shop sold 24 calculators on Wednesday.

- (b) Find the number of calculators sold on Thursday.

$$\boxed{\square} \quad \boxed{\square} \quad \boxed{\square} = 24 \text{ so, } \boxed{\square} = 8$$

$$8 \div 4 = 2 \Rightarrow \square = 2 \quad \text{Thur has } 20 \square, \text{ so, } 20 \times 2 = 40$$

.....
40
(2)

- (c) Find the ratio of the number of calculators sold on Tuesday to the number of calculators sold on Friday.

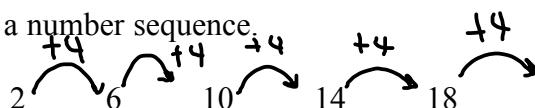
Give your ratio in its simplest form.

$$\begin{array}{ll} \text{Tue : } 8 \times 2 = 16 & \text{Tu : fr} \\ \text{fri : } 13 \times 2 = 26 & \div 2 \quad (16 : 26) \div 2 \\ & 8 : 13 \end{array}$$

.....
8 : 13
(2)

(Total for Question 3 is 5 marks)

- 4 Here are the first five terms of a number sequence.



- (a) Write down the next two terms of the sequence.

$$18 + 4 = 22$$

$$22 + 4 = 26$$

....., 26
(1)

- (b) Explain how you worked out your answer.

each term is +4 to the last term

(1)

- (c) Find the 11th term of the sequence.

n	1	2	3	4	5	n th term = $4n - 2$
$4n$	4	8	12	16	20	11 th term = $4(11) - 2$
difference with sequence	-2	-2	-2	-2	-2	= 42

- (d) Explain why 95 cannot be a term of the sequence.

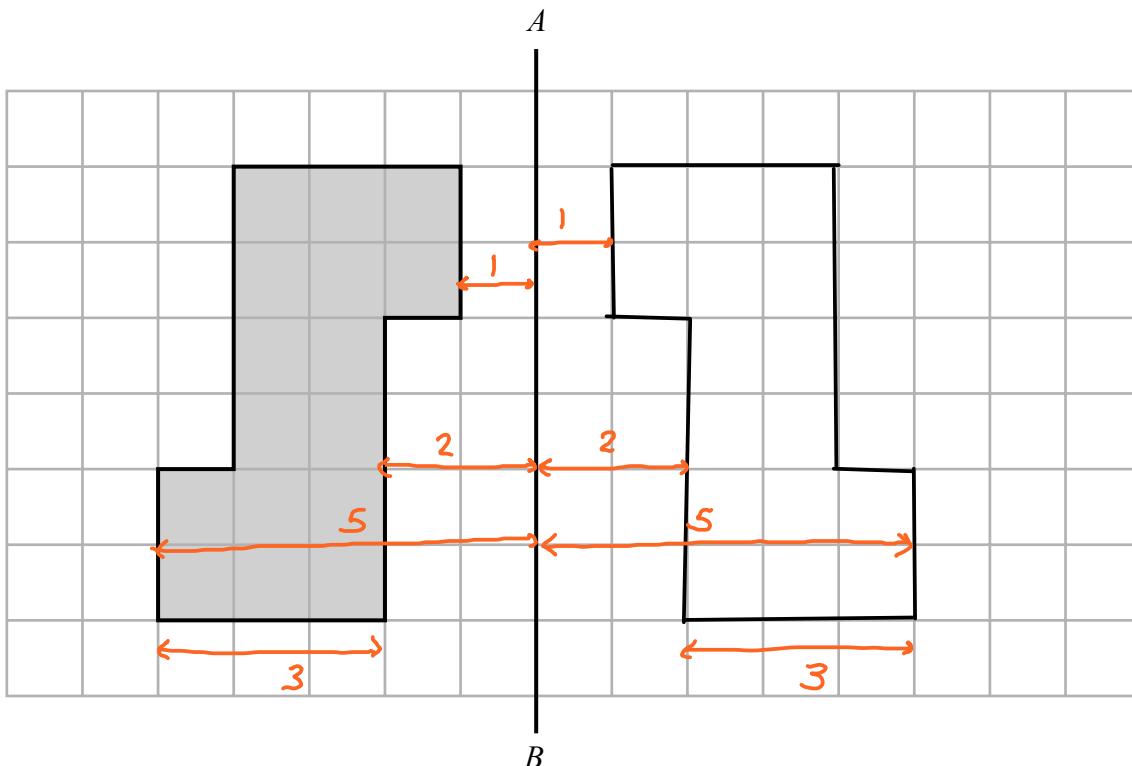
all the numbers in the sequence are even,

95 is odd.

(1)

(Total for Question 4 is 4 marks)

- 5 The diagram shows a shaded shape drawn on a centimetre grid and a line AB .



- (a) Write down the order of rotational symmetry of the shape.

\downarrow
Shape looks the same at 0° and 180° 2 (1)

- (b) Work out the perimeter of the shape.

count each side of the square
each side = 1cm 20 cm
20 small square sides = 20cm (1)

- (c) Work out the area of the shape.

count no. squares inside shape
each square = 1cm² area 16 cm²
 $\boxed{1}$ (1)

- (d) Reflect the shape in the line AB .

(2)

(Total for Question 5 is 5 marks)

- 6 Rhianna has £25 to spend on plants.
Each plant costs £3.95
She buys as many plants as she can.

How much change should Rhianna receive from £25?

£25 ÷ 3.95 = 6.329 → she can buy 6 whole plants

$$6 \times £3.95 = £23.70$$

$$25 - 23.7 = 1.30$$

f 1.30

(Total for Question 6 is 3 marks)

- 7 (a) Simplify $8c + 7m - 5c + 2m$

$$= 3c + 9m \quad \left. \begin{array}{l} \\ = (8c - 5m) + (7m + 2m) \end{array} \right\} \text{collect like terms}$$

$$3c + 9m$$

- (b) Solve $5x - 9 = 4$

$$\begin{aligned}
 & \text{Solve } 5x - 9 = 4 \\
 +9 & \quad \left(\begin{array}{l} \\ \downarrow \end{array} \right) \quad +9 \\
 5x &= 13 \\
 \div 5 & \quad \left(\begin{array}{l} \\ \downarrow \end{array} \right) \quad \div 5 \\
 x &= \frac{13}{5} \\
 & \quad \left(\begin{array}{l} \\ \downarrow \end{array} \right) \\
 x &= 2.6
 \end{aligned}$$

$$x = \underline{\quad 2 \cdot 6 \quad} \quad (2)$$

(Total for Question 7 is 4 marks)

- 8 This rule can be used to work out the shortest distance from the screen a viewer should sit to watch TV.

Multiply the width of the screen by 3

Greg is going to watch his TV.

The width of the screen is 65 cm.

- (a) Work out the shortest distance from the screen he should sit.

$$65 \times 3 = 195 \text{ cm}$$

.....
195 cm
(1)

Rashida is going to watch her TV.

The shortest distance from the screen she should sit is 249 cm.

- (b) Work out the width of the screen.

$$\frac{249 \text{ cm}}{3} = 83 \text{ cm}$$

.....
83 cm
(2)

The width of a TV screen is w cm.

The shortest distance from the screen a viewer should sit to watch this TV is d cm.

- (c) Write down a formula for d in terms of w .

$$3w = d$$

multiply width, w , by 3 to get
distance, d .

.....
 $3w = d$
(2)

(Total for Question 8 is 5 marks)

- 9 ABC is an isosceles triangle.

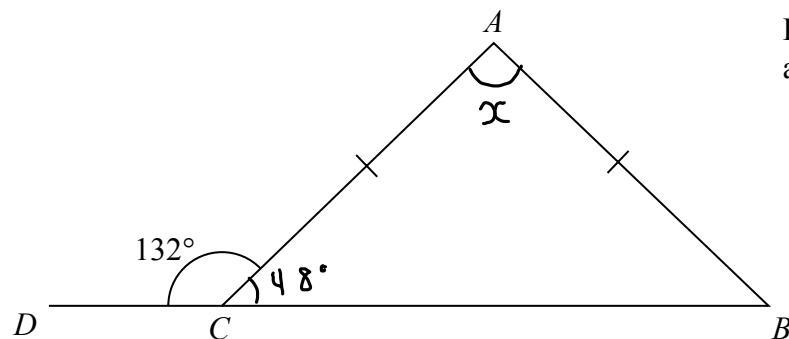


Diagram **NOT**
accurately drawn

DCB is a straight line.

$AC = AB$.

$\text{Angle } DCA = 132^\circ$

$$\angle BCA = 180 - 132 = 48$$

angles on a straight line sum 180°

Work out the size of angle CAB .

Give a reason for each stage in your working.

$$\angle CBA = 48^\circ = \angle BCA$$

base angles in an isosceles triangle
are equal

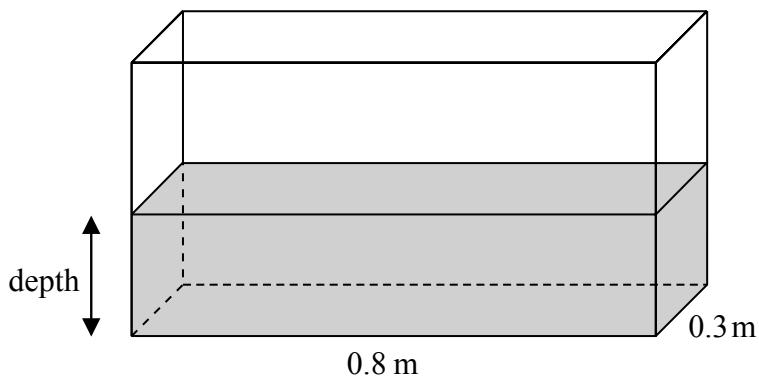
$$\angle CAB = 180 - 48 - 48 = 84^\circ$$

angles in a triangle sum 180°

84

(Total for Question 9 is 5 marks)

10

Diagram NOT
accurately drawn

A fish tank is in the shape of a cuboid.

The length of the fish tank is 0.8 m and the width is 0.3 m.

The volume of water in the fish tank is 108 litres.

$$1 \text{ m}^3 = 1000 \text{ litres.}$$

Work out the depth of the water in the fish tank.

$$\begin{aligned} 1 \text{ m}^3 &= 1000 \text{ L} \\ x 0.108 &\quad) \\ 0.108 \text{ m}^3 &= 108 \text{ L} \quad) x 0.108 \end{aligned}$$

$$\text{volume} = 0.108 \text{ m}^3$$

$$\text{volume} = \text{depth} \times 0.8 \times 0.3$$

$$0.108 = \text{depth} \times 0.24$$

$$\text{depth} = 0.45 \text{ m}$$

0.45

m

(Total for Question 10 is 3 marks)

11 (a) Work out the value of $\frac{51.7 \times 2.8}{9 + \sqrt{3}}$.

Write down all the figures on your calculator display.

put whole sum into calculator

13.48856827

(2)

(b) Give your answer to part (a) correct to 3 significant figures.

13.488... rounds up to 13.5

13.5

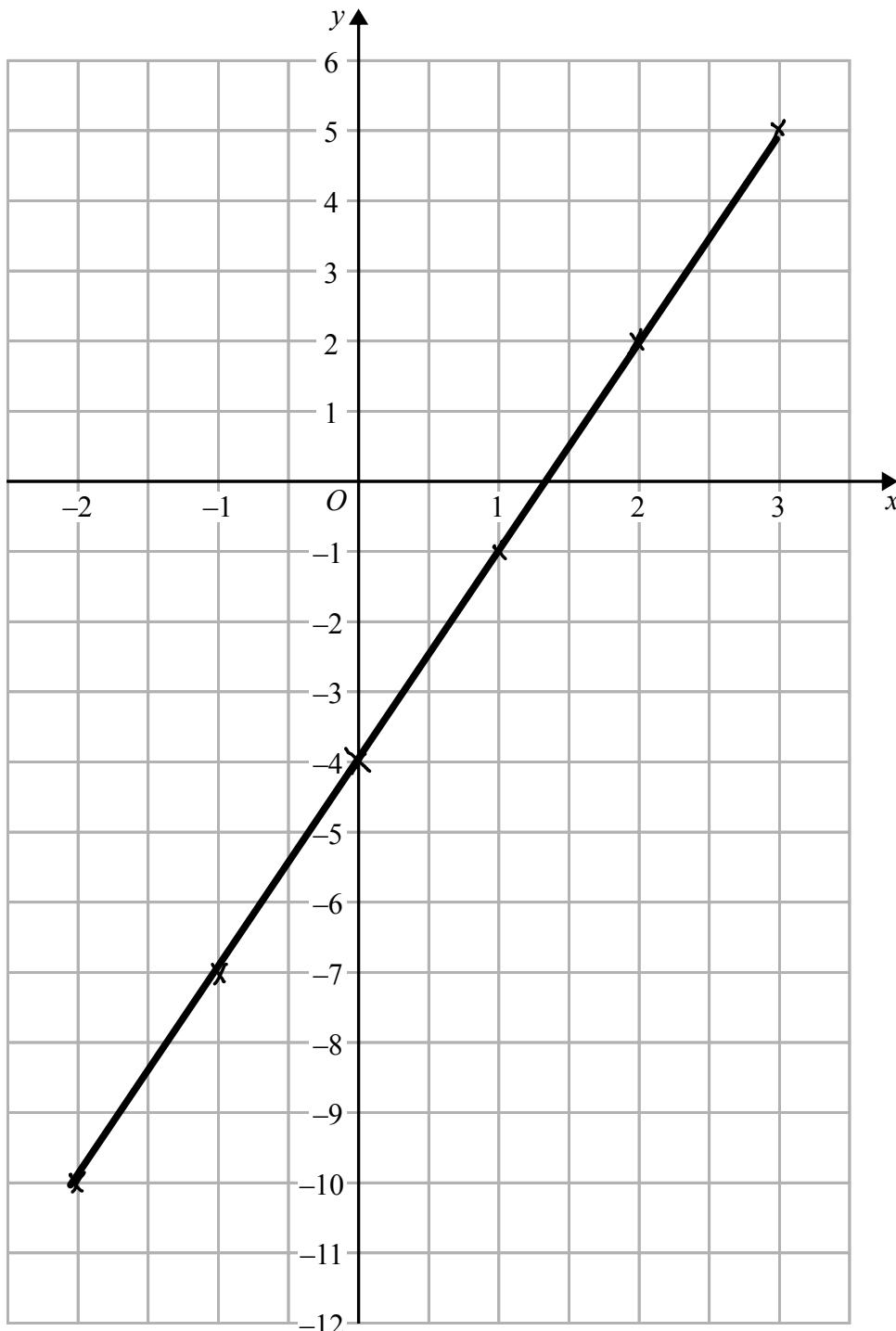
(1)

(Total for Question 11 is 3 marks)

DO NOT WRITE IN THIS AREA

- 12 On the grid, draw the graph of $y = 3x - 4$ for values of x from -2 to 3

See table at the bottom



(Total for Question 12 is 4 marks)

x	-2	-1	0	1	2	3
y	-10	-7	-4	-1	2	5

- 13 A box contains four different kinds of sweets.
 Debbie takes at random a sweet from the box.
 The table shows the probabilities that Debbie takes an orange sweet or a cola sweet or a lemon sweet.

Sweet	Probability
orange	0.15
cola	0.40
lemon	0.35
strawberry	

- (a) Work out the probability that Debbie takes a strawberry sweet.

total probability = 1

$$1 - 0.15 - 0.4 - 0.35 = 0.1$$

..... 0.1

(2)

There are 40 sweets in the box.

- (b) How many of the sweets in the box are lemon?

$$0.35 \times 40 = 14$$

..... 14

(2)

(Total for Question 13 is 4 marks)

- 14 (a) Expand $5(2g+7)$

$$= 10g + 35$$

$$\text{..... } 10g + 35$$

(1)

x is an integer.

- (b) Write down all the values of x that satisfy $-3 < x \leq 2$

$$\text{..... } -2, -1, 0, 1, 2$$

(2)

(Total for Question 14 is 3 marks)

15 Anil lives in England.

He does a search on the internet and sees the same type of camera on sale in Spain and in America.

In Spain, the camera costs 149 euros.

In America, the camera costs \$164.78

Anil finds out these exchange rates.

Exchange rates

1 euro = £0.76

£1 = \$1.54

How much cheaper is the camera in America than in Spain?

Give your answer in pounds (£).

$$\text{Spain: } \begin{cases} 1 \text{ euro} = €0.76 \\ 149 \text{ euros} = €113.24 \end{cases} \quad \text{America: } \begin{cases} \$1 = \$1.54 \\ \$107 = \$164.78 \end{cases}$$

$$\text{£}113.24 - \text{£}107 = \text{£}6.24$$

£ 6 · 24

(Total for Question 15 is 4 marks)

- 16 Yoko flew on a plane from Tokyo to Sydney.
The plane flew a distance of 7800 km.
The flight time was 9 hours 45 minutes.

Work out the average speed of the plane in kilometres per hour.

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

$$\text{speed} = \frac{7800}{9.75}$$

$$= 800$$

9hr 45min's
= 9.75hrs
as 45mins = $\frac{3}{4}$ hr

.....
800 km/h

(Total for Question 16 is 3 marks)

P A J

- 17 Penny, Amjit and James share some money in the ratio 3:6:4
Amjit gets \$28 more than James.

Work out the amount of money that Penny gets.

$$6 - 4 = 2$$

$$\text{so, } 2 \text{ parts} = \$28 \quad \therefore 1 \text{ part} = \$14$$

$$\begin{array}{rcl} P : A : J \\ \times 14 & \downarrow 3 & \downarrow 6 & \downarrow 4 \\ 42 & : 84 & : 56 & \times 14 \\ \hline \end{array}$$

.....
\$ 42

(Total for Question 17 is 3 marks)

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DO NOT WRITE IN THIS AREA

18 A factory has 60 workers.

The table shows information about the distances, in km, the workers travel to the factory each day.

Distance (d km)	Frequency	midpoint (x)	$\text{freq} \times x$
$0 < d \leq 5$	12	2.5	30
$5 < d \leq 10$	6	7.5	45
$10 < d \leq 15$	4	12.5	50
$15 < d \leq 20$	6	17.5	105
$20 < d \leq 25$	14	22.5	315
$25 < d \leq 30$	18	37.5	495

(a) Write down the modal class.

with the highest frequency

$25 < d \leq 30$

(1)

(b) Work out an estimate for the mean distance travelled to the factory each day.

add midpoint and frequency \times midpoint column

$$\begin{aligned}\text{total freq} \times x &= 30 + 45 + 50 + 105 + 315 + 495 \\ &= 1040\end{aligned}$$

$$\text{mean} = \frac{\text{fx}}{\text{total f}} = \frac{1040}{60}$$

17.3 km
(4)
(35f)

One of these workers is chosen at random.

(c) Write down the probability that this worker travels more than 20 km to the factory each day.

$$d > 20 \Rightarrow 18 + 14 \text{ people} = 32$$

$$\frac{32}{60} = \frac{8}{15}$$

8/15

(2)

(Total for Question 18 is 7 marks)

- 19 Nigel bought 12 boxes of melons.
He paid \$15 for each box.
There were 12 melons in each box.

Nigel sold $\frac{3}{4}$ of the melons for \$1.60 each.

He sold all the other melons at a reduced price.

He made an overall profit of 15%

Work out how much Nigel sold each reduced price melon for.

$$\text{Total no. melons} = 12 \times 12 = 144$$

12 boxes, 12 per box

$$\text{full price melons} : \frac{3}{4} \times 144 = 108 \text{ melons}$$

$$108 \times \$1.60 = \$172.80$$

$$\text{reduced melons} : \frac{1}{4} \times 144 = 36$$

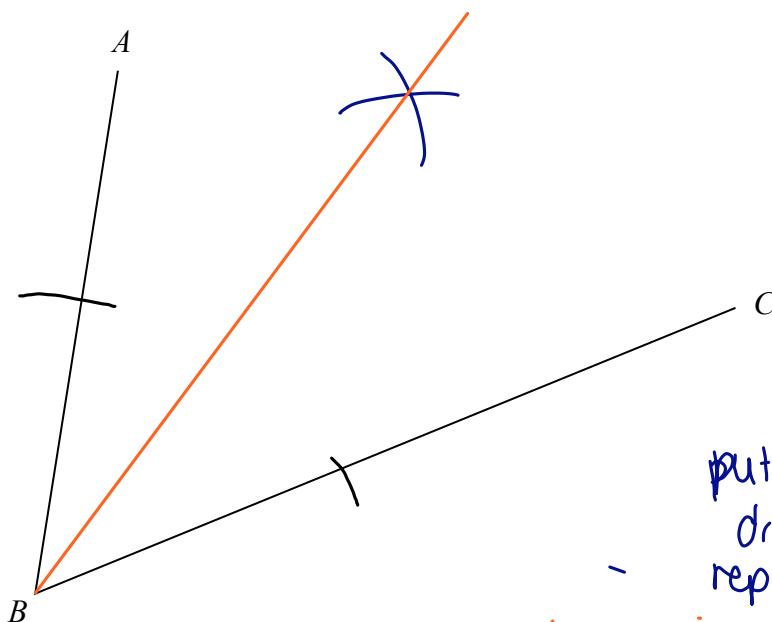
$$\$207 - \$172.80 = \$34.20 \text{ from reduced melons}$$

$$\frac{\$34.20}{36} = \$0.95$$

\$ 0.95

(Total for Question 19 is 5 marks)

- 20** Use ruler and compasses to construct the bisector of angle ABC .
You must show all your construction lines.



make two marks
on BA and BC
using a compass,
with the point
on B.

adjust compass

put at mark on BA and
draw a curve as shown.
repeat for mark on BC.

draw line from B to where the
later marks meet.

(Total for Question 20 is 2 marks)

- 21** (a) Factorise fully $18e^3f + 45e^2f^4$

$$\begin{aligned} & 9e^2f(2e + 5f^3) \\ & = 18e^3f + 45e^2f^4 \end{aligned}$$

$$9ef^2(2e + 5f^3) \quad (2)$$

- (b) Solve $x^2 - 4x - 12 = 0$
Show clear algebraic working.

$$\begin{aligned} & ax^2 + bx + c = 0 \\ & x^2 - 4x - 12 = 0 \\ & (x-6)(x+2) = 0 \quad \downarrow \text{factorise} \\ & \begin{array}{l} \downarrow \text{set each bracket} \\ x-6=0 \quad x+2=0 \end{array} \quad \begin{array}{l} \downarrow \text{to 0} \\ x=6 \quad x=-2 \end{array} \end{aligned}$$

$$x=6, x=-2 \quad (3)$$

(Total for Question 21 is 5 marks)

22

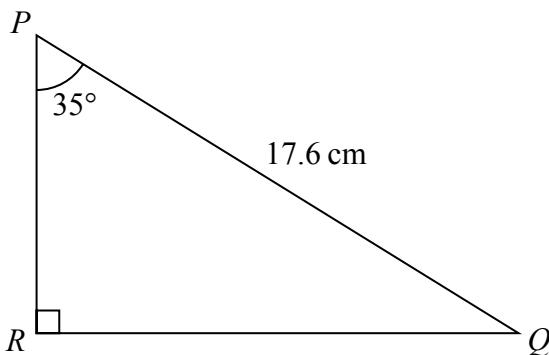


Diagram NOT
accurately drawn

Calculate the length of PR .

Give your answer correct to 3 significant figures.

$$\cos \theta = \frac{a}{h}$$

$$\begin{aligned} \cos 35 &= \frac{PR}{17.6} \\ \cos 35 \times 17.6 &= PR \end{aligned}$$

$$14.41707596 = PR$$

$$\text{to } 3\text{s.f.} \rightarrow PR = 14.4$$

14.4 cm

(Total for Question 22 is 3 marks)

- 23 In a sale, all normal prices are reduced by 15%
The normal price of a mixer is reduced by 22.50 dollars.

Work out the normal price of the mixer.

$$\begin{aligned} \frac{22.50}{15} &= 1.5 \\ \$1.50 &= 1\% \\ \$150.00 &= 100\% \end{aligned}$$

150 dollars

(Total for Question 23 is 3 marks)

- 24 The table shows the diameters, in kilometres, of five planets.

Planet	Diameter (km)
Venus	1.2×10^4
Jupiter	1.4×10^5
Neptune	5.0×10^4
Mars	6.8×10^3
Saturn	1.2×10^5

- (a) Write 1.4×10^5 as an ordinary number.

$$1.4 \times 10^5 = 140000$$

moved 5 places

140,000
(1)

- (b) Which of these planets has the smallest diameter?

Mars
(1)

- (c) Calculate the difference, in kilometres, between the diameter of Saturn and the diameter of Neptune.

Give your answer in standard form.

$$\begin{aligned}
 & \text{Saturn - Neptune} \\
 &= (1.2 \times 10^5) - (5 \times 10^4) \\
 &= 120000 - 50000 \\
 &= 70000 = 7 \times 10^4
 \end{aligned}$$

convert to ordinary number or put into calculator 7×10^4 km
 (2)

(Total for Question 24 is 4 marks)

25

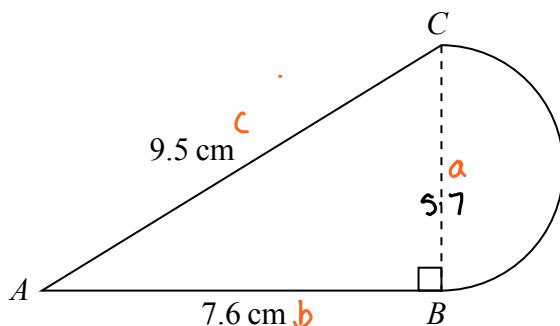


Diagram NOT
accurately drawn

The diagram shows a shape made from triangle ABC and a semicircle with diameter BC .
Triangle ABC is right-angled at B .

$$AB = 7.6 \text{ cm} \text{ and } AC = 9.5 \text{ cm.}$$

Pythagoras' theorem:

$$a^2 + b^2 = c^2$$

Calculate the **area** of the shape.

Give your answer correct to 3 significant figures.

$$BC^2 + AB^2 = AC^2$$

$$BC^2 + 7.6^2 = 9.5^2$$

$$BC^2 = 32.49$$

$$BC = 5.7$$

$$\begin{aligned} \text{area of triangle} &= \frac{1}{2} \times \text{base} \times \text{height} \\ &= \frac{1}{2} \times 7.6 \times 5.7 \\ &= 21.66 \text{ cm}^2 \end{aligned}$$

$$\begin{aligned} \text{area of semi circle} &= \pi r^2 \times \frac{1}{2} \\ &= \pi \times 2.85^2 \times \frac{1}{2} = 12.75879316 \end{aligned}$$

$$\text{diameter} = 5.7 \text{ so radius} = 2.85$$

$$\begin{aligned} \text{total area} &= \text{area. } \Delta + \text{area. D} \\ &= 21.66 + 12.758... \end{aligned}$$

$$= 34.418...$$

$$= 34.4 \quad \text{↓ rounds down to 34.4 for 3sf}$$

$$34.4 \text{ cm}^2$$

(Total for Question 25 is 5 marks)

TOTAL FOR PAPER IS 100 MARKS