

Write your name here

Surname

Other names

Pearson Edexcel
International GCSE

Centre Number

--	--	--	--	--	--

Candidate Number

--	--	--	--	--

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.

Turn over ►

S51830A

©2016 Pearson Education Ltd.

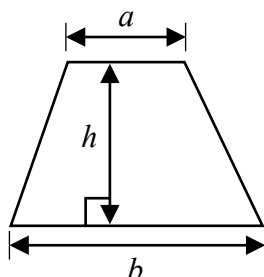
1/1/



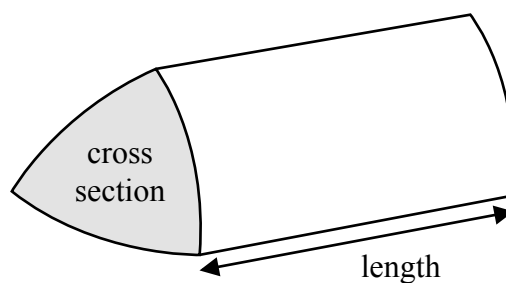
PEARSON

International GCSE Mathematics
Formulae sheet – Foundation Tier

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

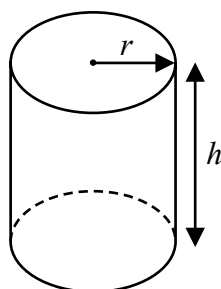


Volume of prism = area of cross section \times length



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

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

15, 31

(1)

(b) a multiple of 6

$$6 \times 4 = 24$$

$$6 \times 6 = 36$$

24, 36

(1)

(c) a square number

$$6^2 = 36$$

$$8^2 = 64$$

36, 64

(1)

(d) a prime number

↓ factors of only one and itself

2, 31

(1)

(Total for Question 1 is 4 marks)

2 (a) Write 64% as a fraction.

Give your fraction in its simplest form.

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

$\frac{16}{25}$

(2)

(b) Write 9% as a decimal.

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

0.09

(1)

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

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

14

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.

$3 \times 8 = 24$ so, $1 \times 8 = 8$

$8 \div 4 = 2 \Rightarrow \square = 2$ Thur has 20 \square , 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.

Tue : $8 \times 2 = 16$

Tu : fr

Fri : $13 \times 2 = 26$

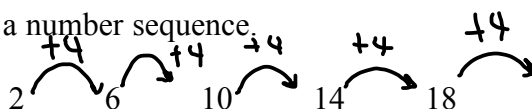
$\div 2 \left(\begin{array}{l} 16 : 26 \\ 8 : 13 \end{array} \right) \div 2$

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.

$$18 + 4 = 22$$

$$22 + 4 = 26$$

22, 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
4n	4	8	12	16	20
difference with sequence	-2	-2	-2	-2	-2

$$n\text{th term} = 4n - 2$$

$$11\text{th term} = 4(11) - 2 = 42$$

(1)

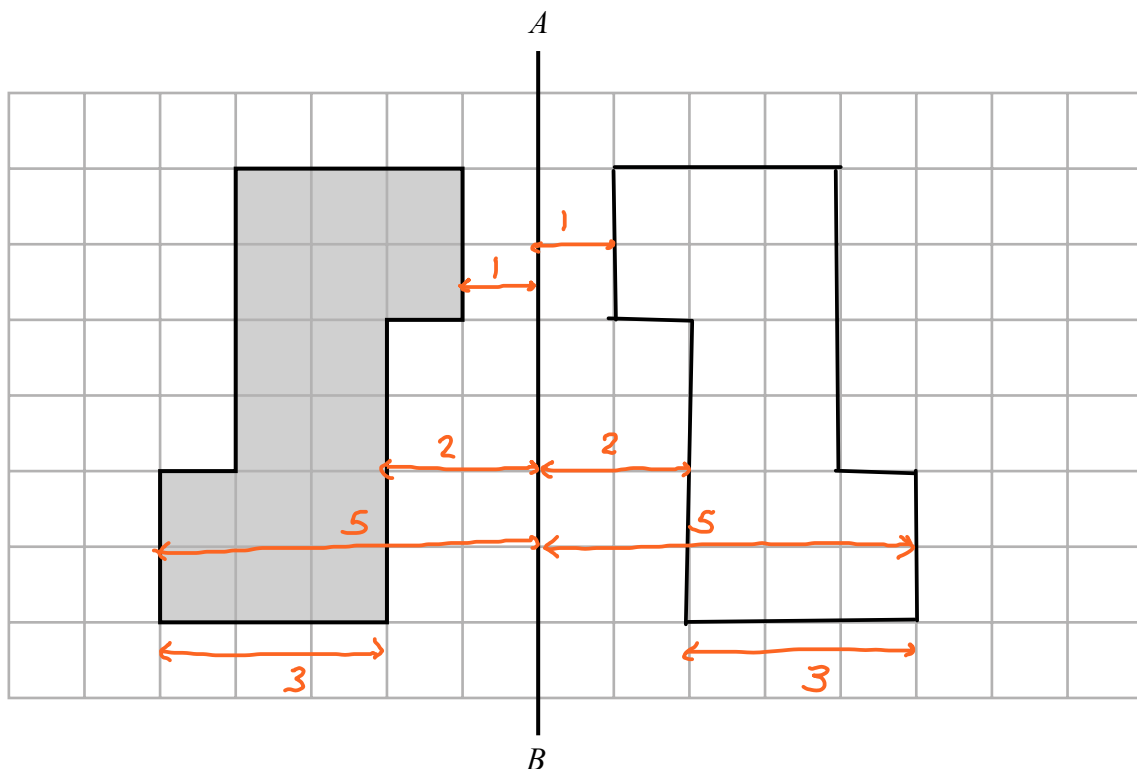
(d) Explain why 95 cannot be a term of the sequence.

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.

↓
 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 = 1cm^2 area 16 cm^2
 16 (1)

(d) Reflect the shape in the line AB .

(2)

(Total for Question 5 is 5 marks)

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

- 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?

$$£25 \div 3.95 = 6.329 \rightarrow \text{she can buy 6 whole plants}$$

$$6 \times £3.95 = £23.70$$

$$25 - 23.7 = £1.30$$

£ 1.30

(Total for Question 6 is 3 marks)

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

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

$3c + 9m$
(2)

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

$$\begin{array}{l} +9 \downarrow \quad 5x = 13 \quad \uparrow +9 \\ \div 5 \downarrow \quad x = \frac{13}{5} \quad \uparrow \div 5 \\ x = 2.6 \end{array}$$

$x = 2.6$
(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)

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

9 ABC is an isosceles triangle.

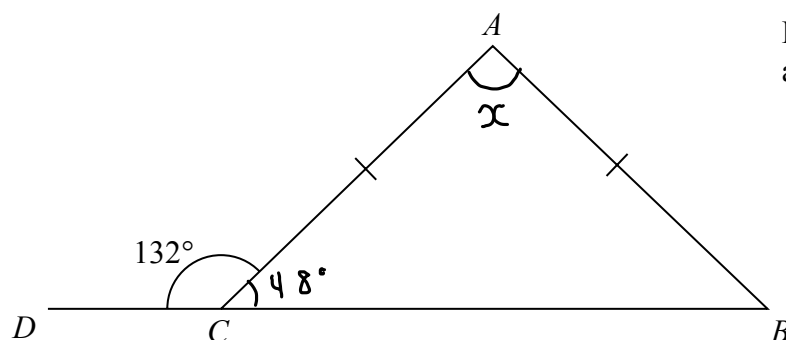


Diagram **NOT**
accurately drawn

DCB is a straight line.

$AC = AB$.

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

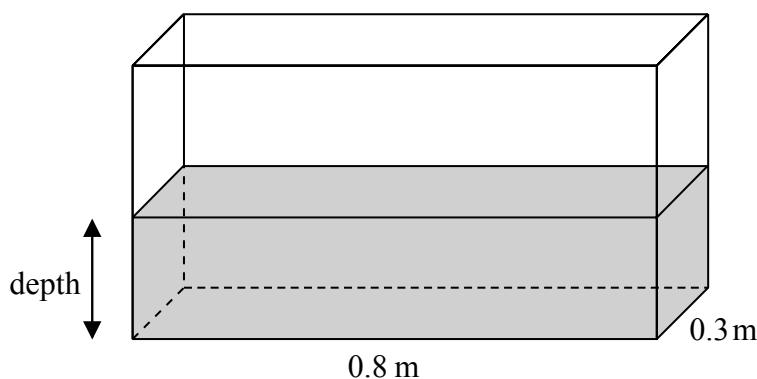


Diagram NOT accurately drawn

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 m³ = 1000 litres.

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

Handwritten notes:
 $1 \text{ m}^3 = 1000 \text{ L}$
 $0.108 \text{ m}^3 = 108 \text{ L}$ (with a bracket and $\times 0.108$ next to it)
 $\times 0.108$ (written vertically next to the previous equation)

Handwritten: volume = 0.108 m^3

Handwritten: volume = depth $\times 0.8 \times 0.3$

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

Handwritten: depth = 0.45 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.

Handwritten: put whole sum into calculator

..... 13.48856827

(2)

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

Handwritten: 13.488... rounds up to 13.5

..... 13.5

(1)

(Total for Question 11 is 3 marks)

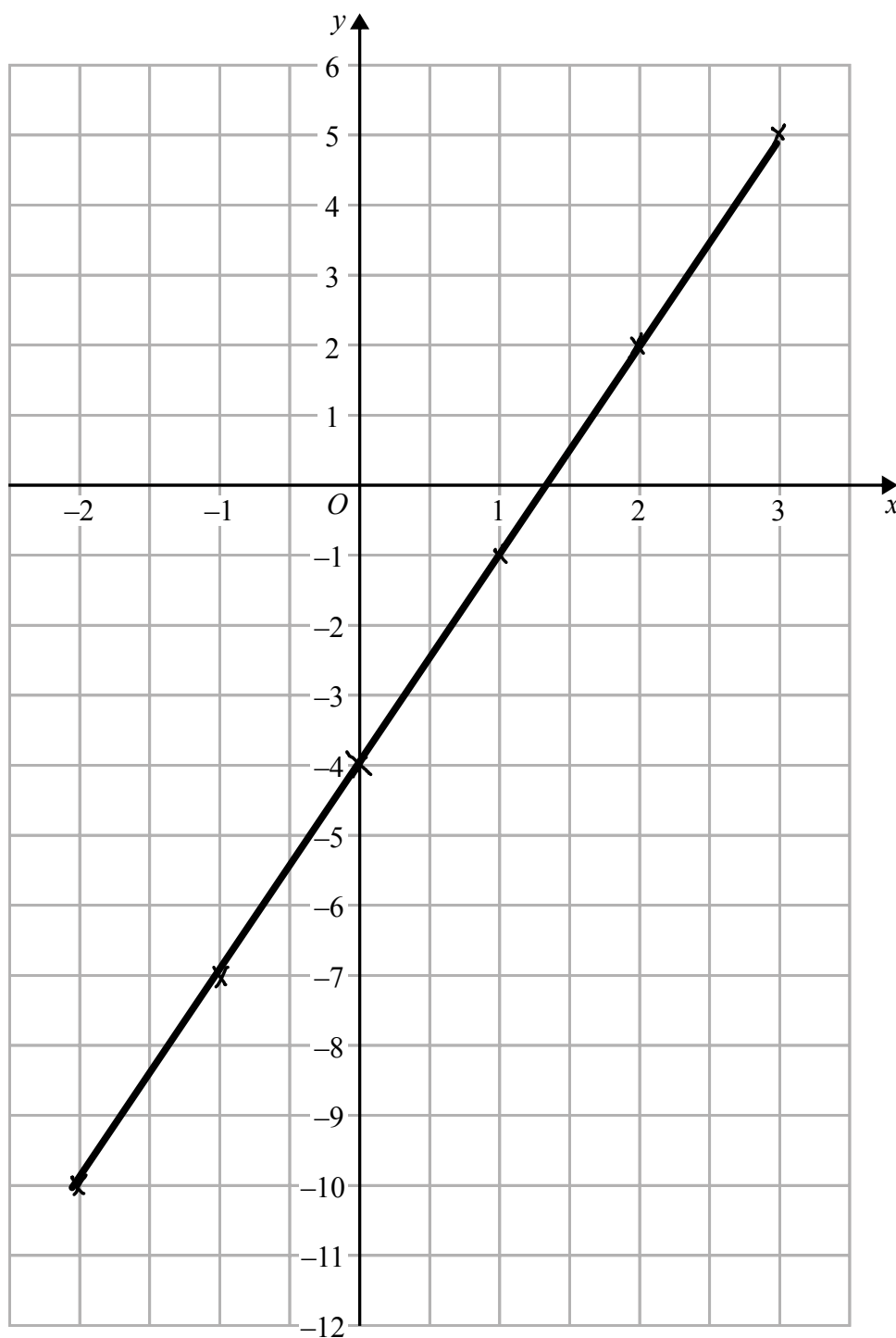
DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

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.

$$\text{total probability} = 1$$

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

$$\frac{0.1}{\dots\dots\dots}$$

(2)

There are 40 sweets in the box.

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

$$0.35 \times 40 = 14$$

$$\frac{14}{\dots\dots\dots}$$

(2)

(Total for Question 13 is 4 marks)

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

$$= 10g + 35$$

$$\frac{10g + 35}{\dots\dots\dots}$$

(1)

x is an integer.

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

$$\frac{-2, -1, 0, 1, 2}{\dots\dots\dots}$$

(2)

(Total for Question 14 is 3 marks)

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

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

$$1 \text{ euro} = \text{£}0.76$$

$$\text{£}1 = \$1.54$$

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

Give your answer in pounds (£).

Spain: $1 \text{ euro} = \text{£}0.76$ $\times 149$
 $149 \text{ euros} = \text{£}113.24$ $0.76 \times 149 = 113.24$

America: $\text{£}1 = \$1.54$ $\times 107$
 $\text{£}107 = \$164.78$ $\frac{164.78}{1.54} = 107$

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

£ 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.

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

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

$$= 800$$

$$\begin{aligned} 9\text{hr } 45\text{mins} &= 9.75\text{hrs} \\ \text{as } 45\text{mins} &= \frac{3}{4}\text{hr} \end{aligned}$$

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.

$$6 - 4 = 2$$

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

$$\begin{array}{l} P : A : J \\ \begin{array}{l} \text{x14} \swarrow 3 : 6 : 4 \\ 42 : 84 : 56 \end{array} \end{array}$$

\$ 42

(Total for Question 17 is 3 marks)

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)	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

$$\underline{25 < d \leq 30}$$

(1)

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

add midpoint and frequency \times midpoint column

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

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

$$\underline{17.3} \text{ km}$$

(4) (3sf)

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.

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

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

$$\underline{\frac{8}{15}}$$

(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.

amount spent

$$12 \times \$15 = \$180$$

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.

amount made

$$15\% \text{ profit} = 115\% \text{ of money spent}$$

$$1.15 \times \$180 = \$207$$

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

12 boxes, 12 per box

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

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

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

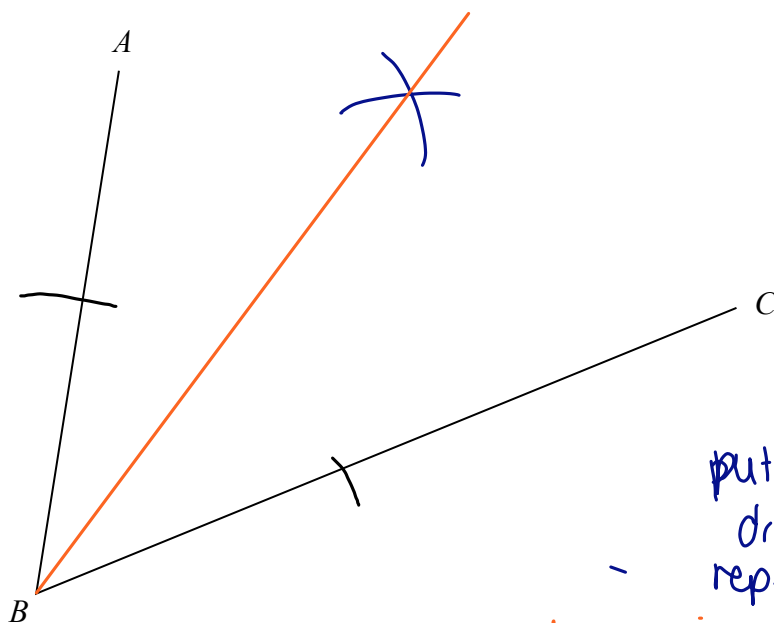
$$\$207 - \$172.80 = \$34.20 \text{ from reduced melons}$$

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

\$ 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 $18e^3f + 45e^2f^4$

$$9e^2f(2e + 5f^3)$$

$$= 18e^3f + 45e^2f^4$$

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

(2)

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

$$ax^2 + bx + c = 0$$

$$x^2 - 4x - 12 = 0$$

↓ factorise

$$(x - 6)(x + 2) = 0$$

↓ set each bracket to 0

$$x - 6 = 0 \quad x + 2 = 0$$

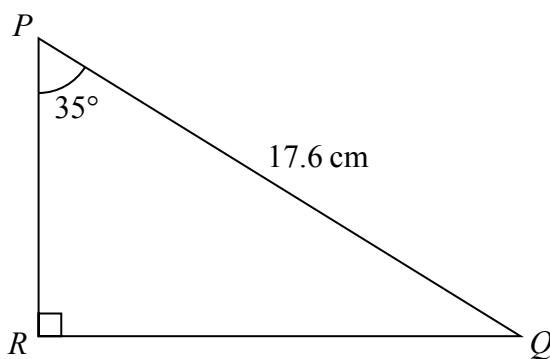
$$x = 6 \quad x = -2$$

$$x = 6, x = -2$$

(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.

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

$$\begin{aligned} \cos 35 &= \frac{PR}{17.6} \\ \cos 35 \times 17.6 &= PR \\ 14.41707596 &= PR \end{aligned}$$

$$\text{to } 3\text{sf} \rightarrow PR = 14.4$$

..... 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.

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

..... 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.

$$1.4 \times 10^5 = \underbrace{140000}_{\text{moved 5 places}}$$

$$\underline{140,000}$$

(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.

$$\begin{aligned} & \text{Saturn} - \text{Neptune} \\ &= (1.2 \times 10^5) - (5 \times 10^4) \\ &= 120,000 - 50,000 \quad \left. \begin{array}{l} \text{convert to ordinary} \\ \text{number or} \end{array} \right\} 7 \times 10^4 \text{ km} \\ &= 70,000 = 7 \times 10^4 \quad \left. \begin{array}{l} \text{put into calculator} \end{array} \right\} \end{aligned}$$

(2)

(Total for Question 24 is 4 marks)

25

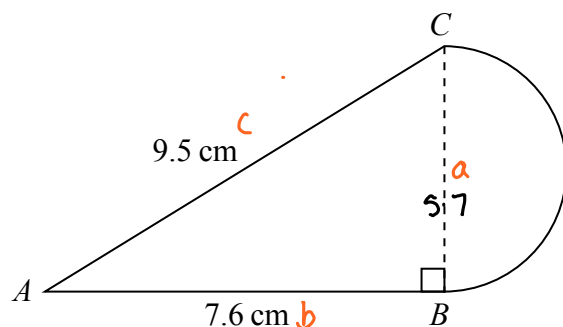


Diagram NOT accurately drawn

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

$AB = 7.6$ cm and $AC = 9.5$ cm.

Calculate the area of the shape.

Give your answer correct to 3 significant figures.

Pythagoras' theorem:

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

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

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

$$BC^2 = 32.49$$

$$BC = 5.7$$

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

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

diameter = 5.7 so radius = 2.85

$$\begin{aligned} \text{total area} &= \text{area. } \Delta + \text{area. } D \\ &= 21.66 + 12.758... \\ &= 34.418... \\ &= 34.4 \quad \Downarrow \text{ rounds down to } 34.4 \text{ for } 3\text{sf} \end{aligned}$$

34.4 cm²

(Total for Question 25 is 5 marks)

TOTAL FOR PAPER IS 100 MARKS

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA