

Write your name here

Surname

Other Names

Mathematics

June 2023 Practice Paper 2 (Calculator) Foundation Tier

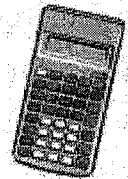
Time: 1 hour 30 minutes

You must have: Ruler graduated in centimetres and millimetres, protractor, pair of 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.
- Answer the questions in the spaces provided – there may be more space than you need.
- **Calculators may be used.**
- Diagrams are **NOT** accurately drawn, unless otherwise indicated.
- You must **show all your working.**



Information

- The total mark for this paper is 80
- 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.
- Keep an eye on the time.
- Try to answer every question.
- Check your answers if you have time at the end.

Foundation Tier Formulae Sheet

Perimeter, area and volume

Where a and b are the lengths of the parallel sides and h is their perpendicular separation:

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

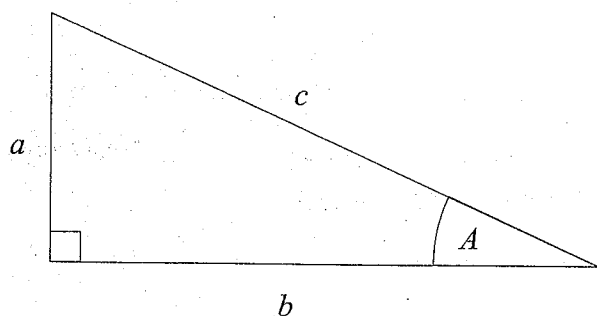
Volume of a prism = area of cross section \times length

Where r is the radius and d is the diameter:

$$\text{Circumference of a circle} = 2\pi r = \pi d$$

$$\text{Area of a circle} = \pi r^2$$

Pythagoras' Theorem and Trigonometry



In any right-angled triangle where a , b and c are the length of the sides and c is the hypotenuse:

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

In any right-angled triangle ABC where a , b and c are the length of the sides and c is the hypotenuse:

$$\sin A = \frac{a}{c} \quad \cos A = \frac{b}{c} \quad \tan A = \frac{a}{b}$$

Compound Interest

Where P is the principal amount, r is the interest rate over a given period and n is number of times that the interest is compounded:

$$\text{Total accrued} = P \left(1 + \frac{r}{100} \right)^n$$

Probability

Where $P(A)$ is the probability of outcome A and $P(B)$ is the probability of outcome B :

$$P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$$

END OF EXAM AID

1 Write 0.83 as a fraction.

$\frac{83}{100}$

(Total for Question 1 is 1 mark)

2 Write down the value of the 7 in the number 5791

700

(Total for Question 2 is 1 mark)

3 What is the time 2 hours 25 minutes after 9.15 am?

11.40 am

(Total for Question 3 is 1 mark)

4 Write down a multiple of 6 that is between 40 and 50

42 or 48

42

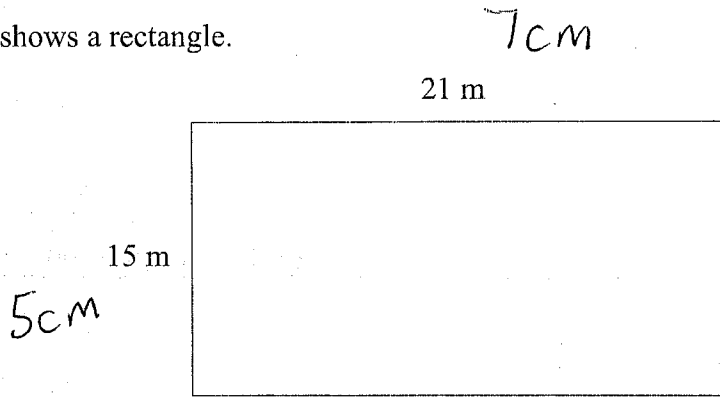
(Total for Question 4 is 1 mark)

5 Change 270 metres into kilometres.

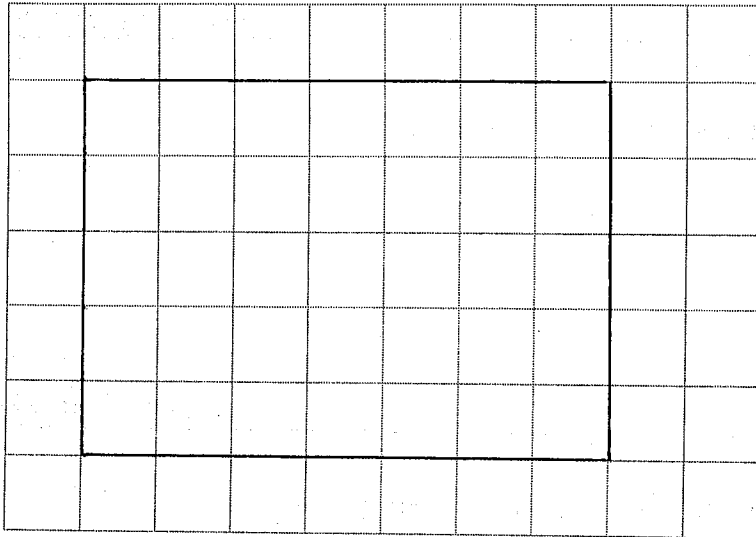
0.27 kilometres

(Total for Question 5 is 1 mark)

6 The diagram shows a rectangle.



On the centimetre grid below, draw an accurate scale drawing of this rectangle.
Use a scale of 1 cm to represent 3 m.



(Total for Question 6 is 2 marks)

- 7 Wasim is going to have a meal.
She can choose one starter and one main course from the menu.

Menu	
Starter	Main
Olives	Lasagne
Dough Balls	Pizza
Bruschetta	Salad

Write down all the possible combinations Wasim can choose.

Olives + Lasagne, Olives + Pizza, Olives + Salad
 Dough Balls + Lasagne, Dough Balls + Pizza, Dough Balls + Salad
 Bruschetta + Lasagne, Bruschetta + Pizza, Bruschetta + Salad

(Total for Question 7 is 2 marks)

- 8 Fran is watching a film at the cinema.

The film started at 17 40

The film is 108 minutes long. 1 hour + 48 mins

When the film ends, Fran takes 15 minutes to get to the bus stop.

A bus leaves the bus stop at 19 45

Does Fran get to the bus stop in time to get this bus?

You must show all your working.

$$\begin{array}{r}
 1740 \\
 + 1 \text{ hour} \\
 \hline
 1840 \\
 + 20 \text{ mins} \\
 \hline
 1900 \\
 + 28 \text{ mins} \\
 \hline
 1928 \\
 + 15 \text{ mins} \\
 \hline
 \underline{\underline{1943}}
 \end{array}
 \left. \begin{array}{l} \\ \\ \\ \end{array} \right\} 48 \text{ mins}$$

Yes

(Total for Question 8 is 3 marks)

9 A baker has three bags of flour, A, B and C.

Bag A and bag B contain the same amount of flour.

Bag C contains 980 g of flour.

In the three bags, there is a total of 2600 g of flour.

Work out the amount of flour in bag A.

$$2600 - 980 = 1620$$

$$\frac{1620}{2} = \underline{\underline{810}}$$

..... 810 g

(Total for Question 9 is 3 marks)

10 Here are the first five terms of a sequence.

1 4 9 16 25

Write down the next two terms of the sequence.

square numbers

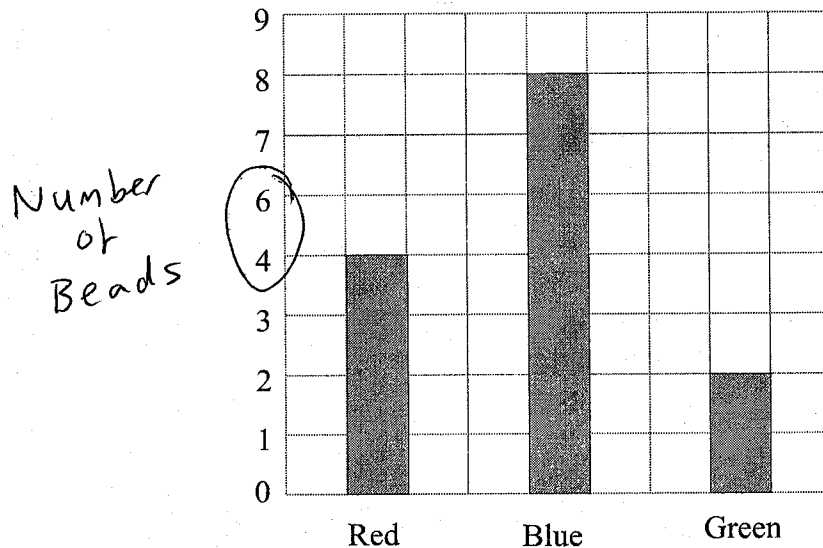
..... 36 , 49

(Total for Question 10 is 2 marks)

- 11 Ashley counted the number of beads of each colour in a bag. Here are the results.

Red	4
Blue	8
Green	2

Ashley drew this bar chart to show the number of beads of each colour. The bar chart is not fully correct.



Write down **two** things that are wrong with Ashley's bar chart.

1 The vertical scale is missing 5

2 There is no label on the vertical scale

(Total for Question 11 is 2 marks)

12 Julian thinks of a number.

$\frac{2}{3}$ of Julian's number is 42

Work out $\frac{3}{7}$ of Julian's number.

$$\frac{2}{3} \text{ of } x = 42$$

$$42 \div 2 = 21$$

$$\frac{1}{3} \text{ of } x = 21$$

$$21 \times 3 = \underline{\underline{63}}$$

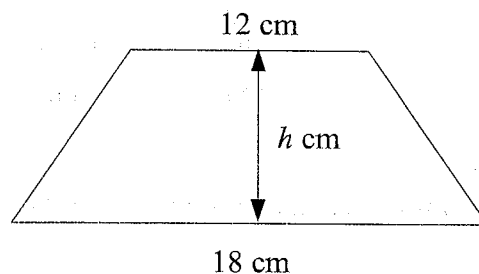
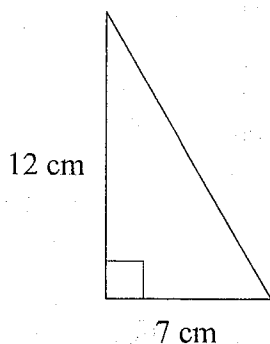
Julian's number is 63

$$\frac{3}{7} \times 63 = 27$$

27

(Total for Question 12 is 2 marks)

13 The diagram shows a right-angled triangle and a trapezium.



The area of the trapezium is 5 times the area of the triangle.
The perpendicular height of the trapezium is h cm.

Find the value of h .

$$\text{Area of triangle} = \frac{12 \times 7}{2} = 42 \text{ cm}^2$$

$$42 \times 5 = 210 \text{ (Area of trapezium)}$$

$$\frac{1}{2} (12 + 18) \times h = 210$$

$$15h = 210$$

$$\underline{\underline{h = 14}}$$

$$h = \underline{\underline{14}}$$

(Total for Question 13 is 3 marks)

14 There are only 5 blue cards, 2 green cards and 4 red cards in a pack.

Luisa is going to take at random one card from the pack.

(a) Write down the probability that Luisa will take a red card.

$$5 + 2 + 4 = 11$$

$$\frac{4}{11}$$

(2)

Bruno is going to throw a biased dice once.

The probability that the dice will land on six is 0.34

(b) What is the probability that the dice will not land on six?

$$1 - 0.34$$

$$0.66$$

(1)

(Total for Question 14 is 3 marks)

15 The table shows information about the number of goals scored by a football team in 200 matches.

Goals		Frequency	
0	x	55	0
1	x	52	52
2	x	43	86
3	x	41	123
4	x	9	36

(a) Work out the total number of goals scored by the team in all 200 matches.

$$52 + 86 + 123 + 36$$

297

(2)

(b) Find the median number of goals scored by the football team.

~~55~~ 52 games with no goals

52 games with 1 goal

The 100th game has 1 goal.

1

(2)

(Total for Question 15 is 4 marks)

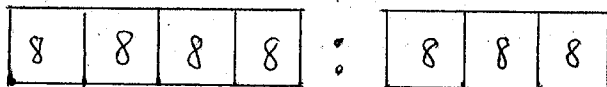
16 Pens and pencils are sold in a shop.

8 pencils cost £1.92

The ratio of the cost of a pen to the cost of a pencil is 4 : 3

Work out the cost of 5 pens.

$$\frac{192}{8} = 24 \quad (24p \text{ per pencil})$$



24p

$$24 \div 3 = 8$$

$$8 \times 4 = 32p \quad (\text{for each pen})$$

$$0.32 \times 5$$

$$\underline{\underline{\pounds 1.60}}$$

(Total for Question 16 is 4 marks)

17 There are 11 grams of fibre in 100 g of oats.

There are 2.4 grams of fibre 100 g of banana.

Rachel has 40 g of oats and 60 g of banana for breakfast.

Work out the total amount of fibre in this breakfast

$$\frac{11}{100} = 0.11 \quad (\text{g of fibre in 10g of oats})$$

$$0.11 \times 40 = \underline{\underline{4.4}}$$

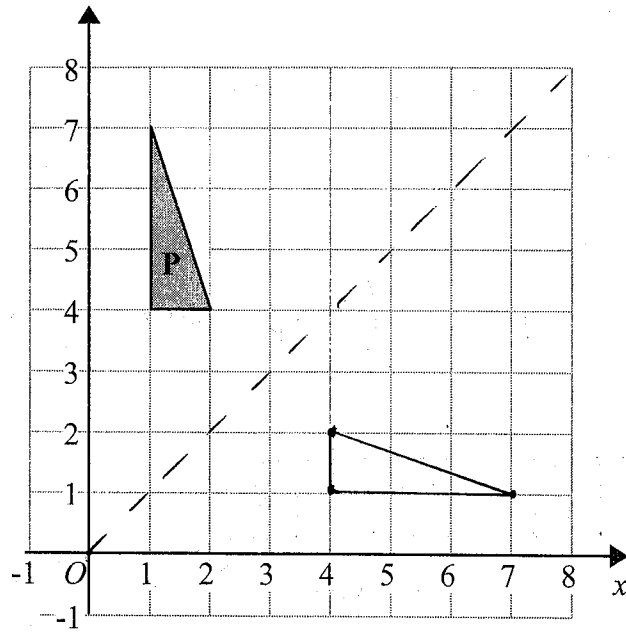
$$\frac{2.4}{100} = 0.024$$

$$0.024 \times 60 = \underline{\underline{1.44}}$$

$$4.4 + 1.44$$

$$\underline{\underline{5.84}} \text{ g}$$

(Total for Question 17 is 4 marks)



Reflect shape **P** in the line $y = x$.

(Total for Question 18 is 2 marks)

19 $A = 5b^2 + 6$

Work out the value of A when $b = -2$

$$5(-2)^2 + 6$$

$A =$ 26

(Total for Question 19 is 2 marks)

20 Franklin goes on holiday to Thailand.

Franklin wants to change £750 into Thai Baht.
He wants to get as many 500 Baht notes as possible.

The exchange rate is £1 = 42.87 ~~rand.~~ Baht

Work out the greatest number of 500 Baht notes that Franklin can get for £750

$$750 \times 42.87 = 32152.5$$

$$\frac{32152.5}{500} = 64.3$$

64

(Total for Question 20 is 3 marks)

21 Taylor wants to invest £15000 for 3 years in a bank.

Shield Bank

Compound Interest

3.6% for each year

Champion Bank

Compound Interest

6.2% for the first year
2.3% for each extra year

Which bank will give Taylor the most interest at the end of 3 years?

You must show all your working

$$15000 \times 1.036^3$$
$$= \underline{\underline{£16679.02}}$$

$$15000 \times 1.062 \times 1.023^2$$
$$= \underline{\underline{£16671.21}}$$

Shield Bank

(Total for Question 21 is 3 marks)

- 22 The table shows the probabilities that a biased dice will land on 2, on 3, on 4 and on 5.

Number on dice	1	2	3	4	5	6
Probability	x	0.1	0.17	0.12	0.09	$3x$

The probability the dice lands on 6 is three times the probability the dice land on 1.

Fred rolls the biased dice 200 times.

Work out an estimate for the total number of times the dice will land on 6.

$$x + 0.1 + 0.17 + 0.12 + 0.09 + 3x = 1$$

$$4x + 0.48 = 1$$

$$4x = 0.52$$

$$x = 0.13$$

$$\begin{aligned} \text{Probability of 6} &= 3 \times 0.13 \\ &= 0.39 \end{aligned}$$

$$0.39 \times 200 = \underline{\underline{78}}$$

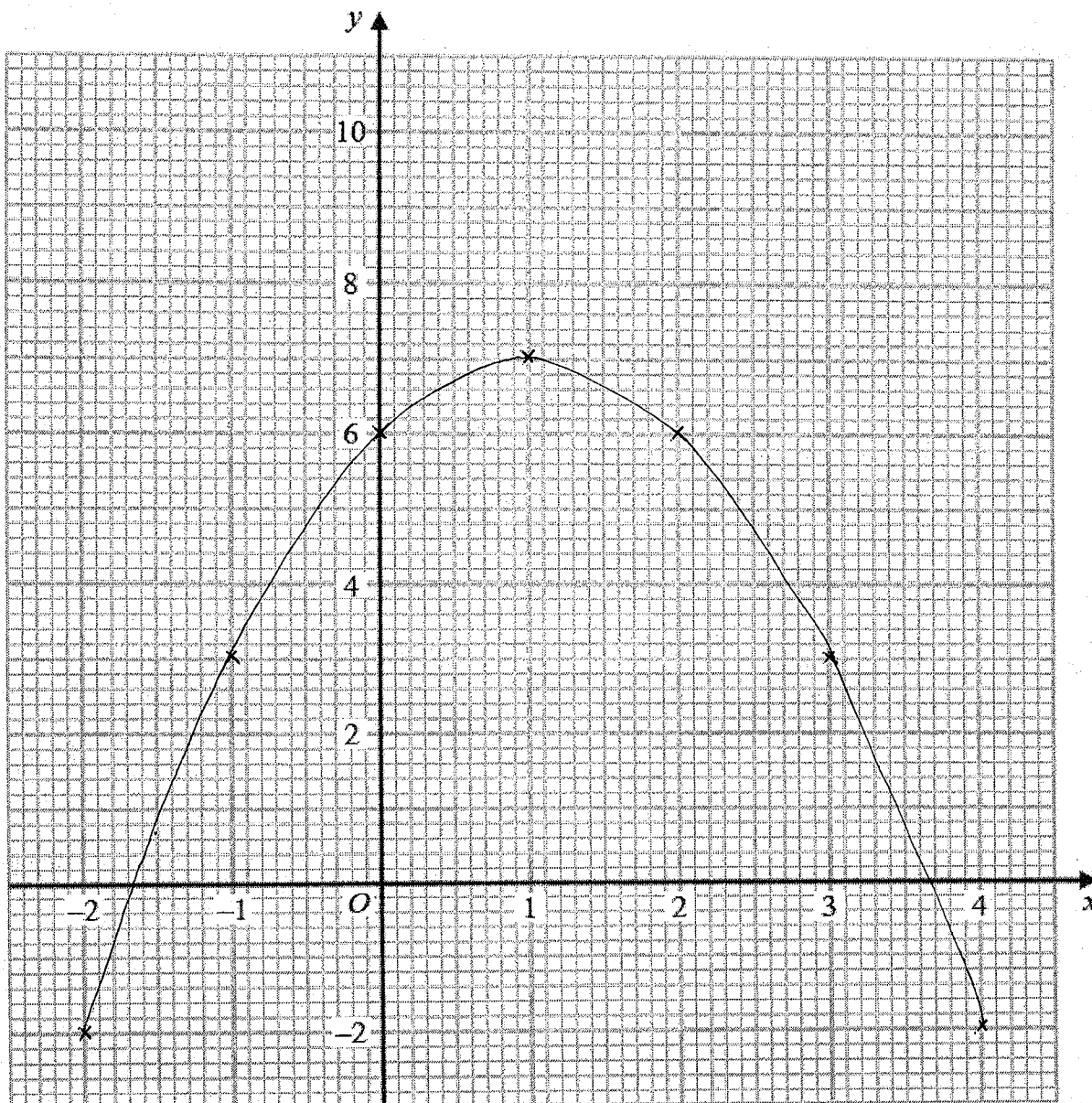
78

(Total for Question 22 is 3 marks)

23 (a) Complete the table of values for $y = 2x + 6 - x^2$

x	-2	-1	0	1	2	3	4
y	-2	3	6	7	6	3	-2

(b) On the grid, draw the graph of $y = 2x + 6 - x^2$ for values of x from -2 to 4



(c) Use your graph to find estimates of the solutions of the equation $2x + 6 - x^2 = 0$

-1.7 and 3.7

(2)

(Total for Question 23 is 6 marks)

or -1.6 and 3.6

24 Use your calculator to work out $\sqrt{\frac{\tan 20^\circ + \sin 25^\circ}{\tan 25^\circ - \sin 20^\circ}}$

(a) Write down all the figures on your calculator display.

2.515706913

(2)

(b) Write your answer to part (a) correct to 2 decimal places.

2.52

(1)

(Total for Question 24 is 3 marks)

25 Work out $(2.16 \times 10^{-5}) \div (2.5 \times 10^{-4})$
Give your answer in standard form.

0.0864

8.64×10^{-2}

8.64×10^{-2}

(Total for Question 25 is 2 marks)

26 The density of orange cordial is 1.21 grams per cm^3 .

The density of carbonated water is 1.01 grams per cm^3 .

An drink with a volume of 280 cm^3 is made by mixing 1 part of orange cordial with 7 parts of carbonated water.

Work out the density of the drink.

~~Give your answer correct to 2 decimal places.~~

$$D = \frac{M}{V}$$

$$M = D \times V$$

↑
Total Volume

1 : 7

8 parts

$$\text{Density} = \frac{\text{Total Mass}}{\text{Total Volume}}$$

$$\frac{280}{8} = 35 \text{ cm}^3 \text{ of cordial}$$

$$35 \times 7 = 245 \text{ cm}^3 \text{ of water}$$

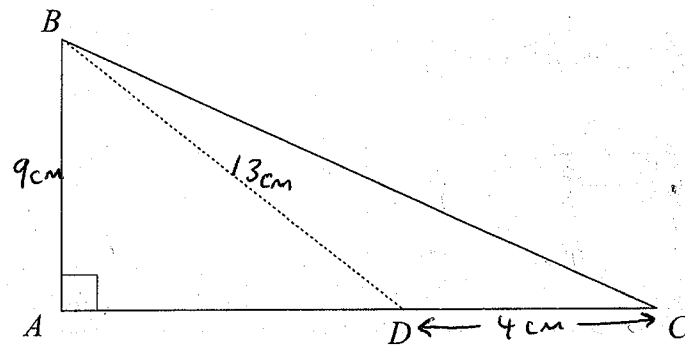
Cordial: Mass = 1.21×35	Water: Mass = 1.01×245
= 42.35	= 247.45

$$\text{Density} = \frac{42.35 + 247.45}{280}$$
$$= 1.035$$

.....1.035.....g/cm³

(Total for Question 26 is 4 marks)

27 ABC is a right-angled triangle.



The point D lies on the line AC .

$$AB = 9 \text{ cm}$$

$$BD = 13 \text{ cm}$$

$$CD = 4 \text{ cm}$$

Work out the perimeter of triangle ABC .

Give your answer correct to 3 significant figures.

$$9^2 + AD^2 = 13^2$$

$$AD^2 = 13^2 - 9^2$$

$$AD^2 = 88$$

$$AD = \sqrt{88}$$

$$= 9.3808 \text{ cm}$$

$$AC = 9.3808 + 4$$

$$= 13.3808 \text{ cm}$$

$$9^2 + 13.38^2 = BC^2$$

$$BC^2 = 260.0$$

$$BC = 16.1 \text{ cm}$$

Perimeter

$$9 + 13.38 + 16.1$$

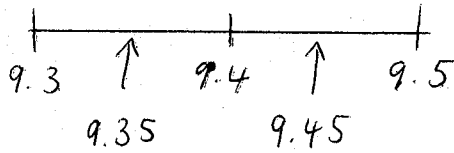
$$= \underline{38.5 \text{ cm}}$$

$$\underline{\underline{38.5}} \text{ cm}$$

(Total for Question 27 is 4 marks)

- 28 A number, m , is rounded to 1 decimal place.
The result is 9.4

Complete the error interval for m .

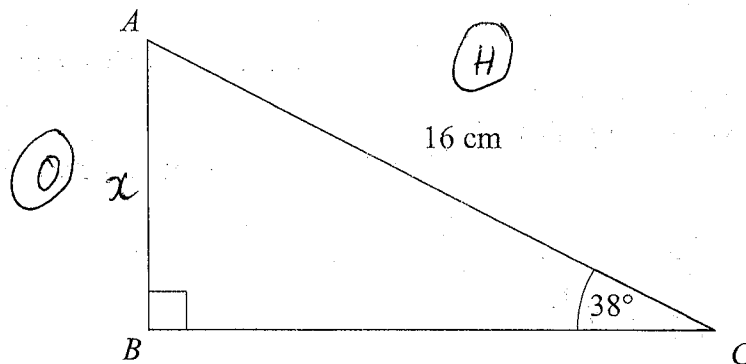


$$9.35 \leq m < 9.45$$

(Total for Question 28 is 2 marks)

- 29 ABC is a right-angled triangle.

SOH ~~CAH~~ ~~TOA~~



Calculate the length of AB .
Give your answer correct to 2 decimal places.

$$\sin(38) = \frac{x}{16}$$

$$x = 16 \sin(38)$$

$$= 9.85$$

$$9.85 \text{ cm}$$

(Total for Question 29 is 2 marks)

30 Solve $3(2x + 1) = 4(5 - x)$

$$6x + 3 = 20 - 4x$$

$$10x + 3 = 20$$

$$10x = 17$$

$$x = 1.7$$

$$x = \underline{1.7}$$

(Total for Question 30 is 3 marks)

31 Each interior angle of a regular polygon is 150°
Work out the number of sides of the polygon.

$$\begin{aligned} \text{Exterior angle} &= 180 - 150 \\ &= 30^\circ \end{aligned}$$

$$\frac{360}{30} = 12$$

12

(Total for Question 31 is 2 marks)

TOTAL FOR PAPER IS 80 MARKS

