

Model Answers

Write your name here						
Surname	Other names					
Pearson Edexcel Level 1/Level 2 GCSE (9 - 1)	Centre Number <table border="1"><tr><td></td><td></td><td></td><td></td><td></td></tr></table>					
	Candidate Number <table border="1"><tr><td></td><td></td><td></td><td></td><td></td></tr></table>					
Mathematics Paper 3 (Calculator) Foundation Tier						
Mock Set 1 – Autumn 2016 Time: 1 hour 30 minutes	Paper Reference 1MA1/3F					
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 <table border="1"><tr><td></td></tr></table>					

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.**
- If your calculator does not have a π button, take the value of π to be 3.142 unless the question instructs otherwise.
- Diagrams are **NOT** accurately drawn, unless otherwise indicated.
- You must **show all your working out.**



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.

Answer ALL questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

- 1 Write 41 675 correct to the nearest 1000

↑
larger than 5 so round up

42000

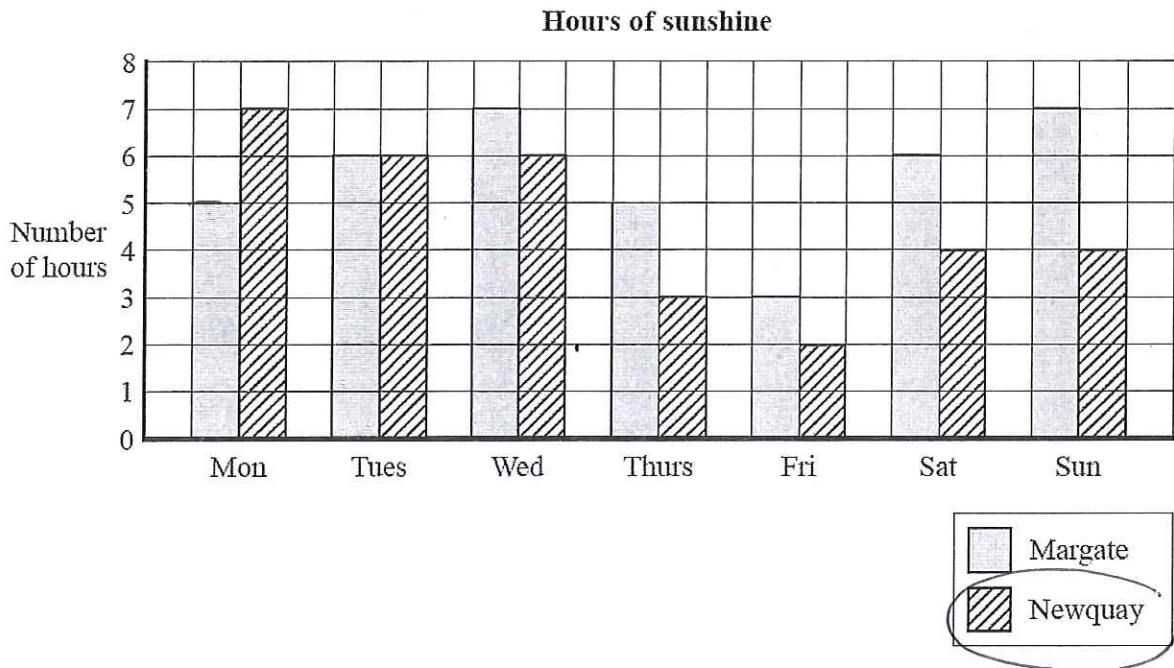
(Total for Question 1 is 1 mark)

- 2 Write the following numbers in order of size.
Start with the smallest number.

3.25 3.2 3.05 3.205
↑ ↑ ↑ ↑
all start with a 3, so look at the digit
after the point
in order 3.05, 3.2, 3.205, 3.25

(Total for Question 2 is 1 mark)

- 3 The bar chart shows the number of hours of sunshine each day last week in Margate and in Newquay.



- (a) On how many days did Newquay have less than 5 hours of sunshine?

4 days
(1)

In total, Margate had more hours of sunshine than Newquay last week.

- (b) How many more?

Margate $5 + 6 + 7 + 5 + 3 + 6 + 7 = 39$
 (look at the columns / height of bar chart)

Newquay $7 + 6 + 6 + 3 + 2 + 4 + 4 = 32$

$$39 - 32 = 7$$

7 hours
(2)

(Total for Question 3 is 3 marks)

- 4 Packs of batteries cost £2.85 each.
Ben has £45 to spend on batteries.

Ben buys as many packs of batteries as he can.
Work out how much change he should get from £45.

$$45 \div 2.85 = 15.7 \dots$$

So can buy 15 packs

$$15 \text{ packs at } 2.85 = 42.75 \quad (15 \times 2.85)$$

Change from £45

$$45 - 42.75$$

£ 2.25

(Total for Question 4 is 3 marks)

- 5 Here is a sequence of patterns made from grey squares and white squares.



pattern number 1



pattern number 2



pattern number 3

- (a) In the space below, draw pattern number 4.

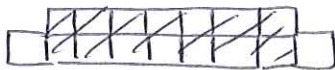
(1)

- (b) Work out the total number of squares needed to make pattern number 7

Pattern 4



Pattern 7



7 squares across

(notice pattern 1 has one square across shaded
Pattern 2 has two squares across
Pattern 3 has three squares across etc)

(2)

Aqsa says,

"The total number of squares needed to make pattern number 20 is double the total number of squares needed to make pattern number 10"

- (c) Is Aqsa correct?

Give a reason for your answer.

pattern number

① ② ③

Shaded squares 2, 4, 6 $2n$

white squares always 2

(2)

Total $2n + 2$

(Total for Question 5 is 5 marks)

So pattern 10 $\rightarrow 2 \times 10 + 2 = 22$

pattern 20 $\rightarrow 2 \times 20 + 2 = 42$

so not double

6 Jim says,

"If you add any two different prime numbers the answer will never be a square number."

Jim is wrong.

Explain why.

Identify prime number
2, 3, 5, 7
so $2 + 7 = 9$ (9 is a square number) (Total for Question 6 is 2 marks)

7 Matthew has eight cards.
There is a number on each card.

3	1	2	3	6	8	7	2
---	---	---	---	---	---	---	---

(a) Work out the range of the numbers on the cards.

highest - lowest
 $8 - 1 = 7$

(1)

(b) Work out the median of the numbers on the cards.

remember to put in order

1, 2, 2, (3, 3), 6, 7, 8

median $\frac{3+3}{2} = 3$

3

(2)

(Total for Question 7 is 3 marks)

- 8 There are 375 pupils at a school.
195 of the pupils are boys.

$\frac{3}{5}$ of the boys walk to school.

$\frac{2}{3}$ of the girls walk to school.

Work out how many pupils walk to school.

$$\frac{3}{5} \text{ of } 195 = 117 \text{ boys walk to school}$$

$$\begin{array}{rcl} 375 & - & 195 \\ \text{total} & \text{boys} & \text{girls} \end{array} = 180$$

$$\text{so } \frac{2}{3} \text{ of } 180 = 120 \text{ girls walk to school}$$

$$117 + 120 = 237 \text{ children walk to school}$$

(Total for Question 8 is 3 marks)

- 9 There are 19.5 litres of water in a water container.
A cup holds 210 ml of water.

How many cups can be completely filled using the water in the water container?

19.5 litres

1000 ml in 1 litre

$$19.5 \times 1000 = 19500 \text{ ml}$$

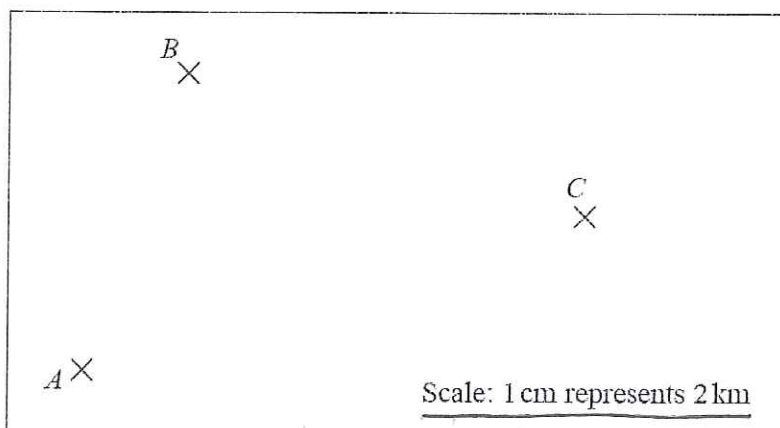
$$\frac{19500}{210} = 92.85 \dots$$

so 92 full cups

92

(Total for Question 9 is 3 marks)

- 10 This accurate scale drawing shows the positions of three villages, A , B and C .



Tom walks from A to B .
He then walks from B to C .

Amy walks from A to C .

Tom walks more kilometres than Amy walks.

How many more?

Tom

AB	4.3 cm	$4.3 \times 2 = 8.6 \text{ km}$
BC	5.8 cm	$5.8 \times 2 = 11.6 \text{ km}$
Tom	$8.6 + 11.6 = \underline{20.2 \text{ km}}$	

Amy

AC	7.1 cm	$7.1 \times 2 = \underline{14.2 \text{ km}}$
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Difference $20.2 - 14.2 = 6 \text{ km}$

(Total for Question 10 is 3 marks)

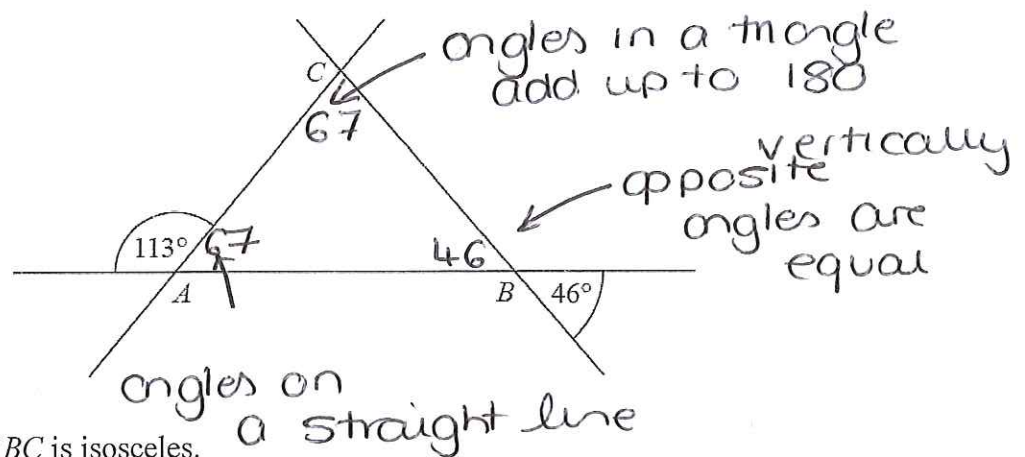
- 11 There are 78 red counters and 52 yellow counters in a bag.

Write the ratio of the number of red counters to the number of yellow counters.
Give your ratio in its simplest form.

$$\begin{array}{rcl} 78 & : & 52 \\ 3 & : & 2 \end{array}$$

(Total for Question 11 is 2 marks)

12 Here is triangle ABC with each of its sides extended.



Show that triangle ABC is isosceles.

Give a reason for each stage of your working.

Isosceles triangle as two angles are the same

(Total for Question 12 is 4 marks)

- 13 Here is part of an advert for a driving school.

8 out of 10 of the people we teach
pass the driving test first time

Ali talked to 56 people who had been taught to drive by the driving school.
43 of these people passed the driving test first time.

Does this support what is said in the advert?
You must show how you get your answer.

8 out of 10 is 80%

80% of 56 = 44.8

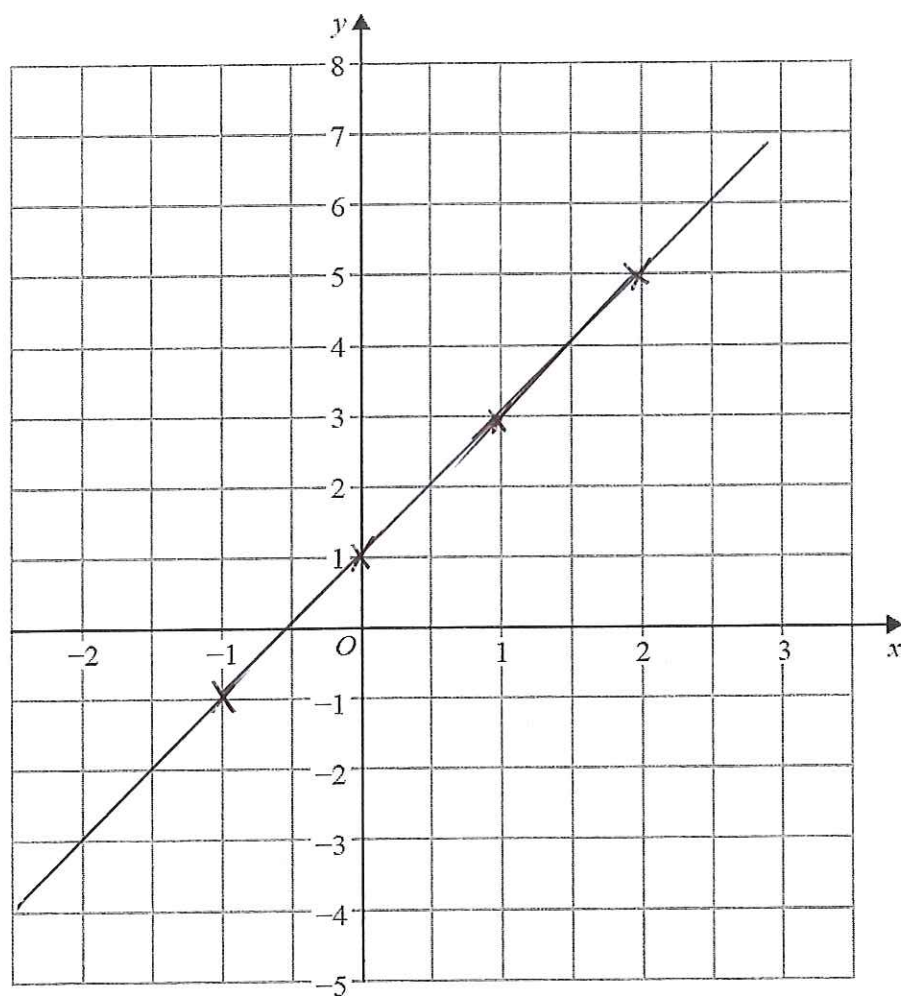
44.8 people is not the same as
43 people

(Total for Question 13 is 3 marks)

- 14 On the grid, draw the graph of $y = 2x + 1$ for values of x from -2 to 3 .

Need to draw a table of results

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



(Total for Question 14 is 3 marks)

15 The n th term of a number sequence is $n^2 + 7$

(a) Find the first three terms of this sequence.

$$n = 1$$

$$n^2 + 7 \\ 1^2 + 7 = \underline{\underline{8}}$$

$$n = 2$$

$$n^2 + 7 \\ 2^2 + 7 \\ 4 + 7 = \underline{\underline{11}}$$

$$n = 3 \quad n^2 + 7 \\ 3^2 + 7 \\ = 9 + 7 \\ = \underline{\underline{16}}$$

..... 8, 11, 16

(2)

128 is a term of this sequence.

(b) Which term?

$$n^2 + 7 = 128$$

$$n^2 = 121$$

$$n = \sqrt{121}$$

$$\underline{\underline{n = 11}}$$

$$\text{or } n^2 + 7 = 128$$

$$n^2 + 7 \rightarrow 128$$

$$11 = \sqrt{121} \leftarrow -7 \leftarrow$$

$$\underline{\underline{n = 11}}$$

.....
(1)

(Total for Question 15 is 3 marks)

- 16 Here are the ingredients needed to make 20 walnut biscuits.

Walnut biscuits	
Ingredients to make 20 biscuits	
50 g	butter
100 g	caster sugar
40 g	flour
50 g	walnuts
2	egg whites

Liz wants to make 50 walnut biscuits.

Work out the amount of each ingredient she needs.

Method 1

20 biscuits \rightarrow 50 biscuits

multiply all
ingredients by 2.5
(double, + half of
ingredient)

Method 2

Find ingredient needed for 1 biscuit ($\div 20$)
then multiply by 50 (50 biscuits)

butter 125 g

caster sugar 250 g

flour 100 g

walnuts 125 g

egg whites 5

(Total for Question 16 is 3 marks)

- 17 (a) Simplify $y^3 + y^3$

$$2y^3$$

(1)

- (b) Factorise $m^2 + m$

↓
put in
brackets

$$m(m+1)$$

(1)

- (c) Make h the subject of the formula $c = 3h + 5$

$$h \rightarrow \begin{array}{ccc} \times 3 & + 5 & \rightarrow c \\ \div 3 & - 5 & \leftarrow \end{array}$$

$$h = \frac{c-5}{3}$$

or $c - 5 = 3h$

$$\frac{c-5}{3} = h$$

$$h = \frac{c-5}{3}$$

(2)

(Total for Question 17 is 4 marks)

- 18 Buses to Ashby leave a bus station every 24 minutes.
Buses to Barford leave the same bus station every 20 minutes.

A bus to Ashby and a bus to Barford both leave the bus station at 7 30 a.m.

When will a bus to Ashby and a bus to Barford next leave the bus station at the same time?

(+24) 7.30 7.54 8.18 8.42 9.06 9.30 9.54

(+20) 7.30, 7.50, 8.10, 8.30, 8.50, 9.10, 9.30, 9.50

9.30

(Total for Question 18 is 3 marks)

- 19 Amzol thinks that $(x+5)^2 = x^2 + 25$ for all values of x .

Is Amzol right?

You must show how you get your answer.

$$(x+5)^2 = x^2 + 25$$

multiply out $(x+5)$

$$(x+5)(x+5)$$

$$= x^2 + 5x + 5x + 25$$

$$= \underline{x^2 + 10x + 25} \quad \text{not same as } \underline{x^2 + 25}$$

or sub a value eg $x=1$

$$(x+5)^2 = x^2 + 25$$

(Total for Question 19 is 2 marks)

- 20 Kim, Laura and Molly share £385.

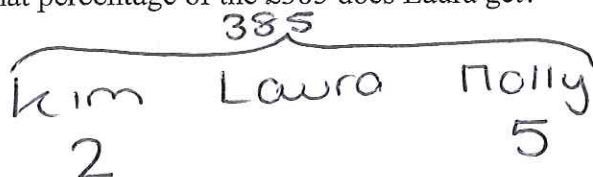
$$(1+5)^2 = 1^2 + 25$$

$$\rightarrow 6^2 = 1^2 + 25$$

$$36 = 26 \quad (\text{not equal})$$

The ratio of the amount of money Kim gets to the amount of money Molly gets is 2 : 5
Kim gets £105 less than Molly gets.

What percentage of the £385 does Laura get?



$$\text{Kim} : \text{Molly} \\ 2 : 5$$

$$\square\square : \square\square\square\square\square$$

$$\text{difference } \square\square\square = 105$$

$$\text{so 1 part / 1 box is } 35$$

$$\begin{array}{cc} \text{Kim} & \text{Molly} \\ 70 & 175 \\ \hline & \text{£245} \end{array}$$

$$\text{Laura } 385 - 245 = \underline{140}$$

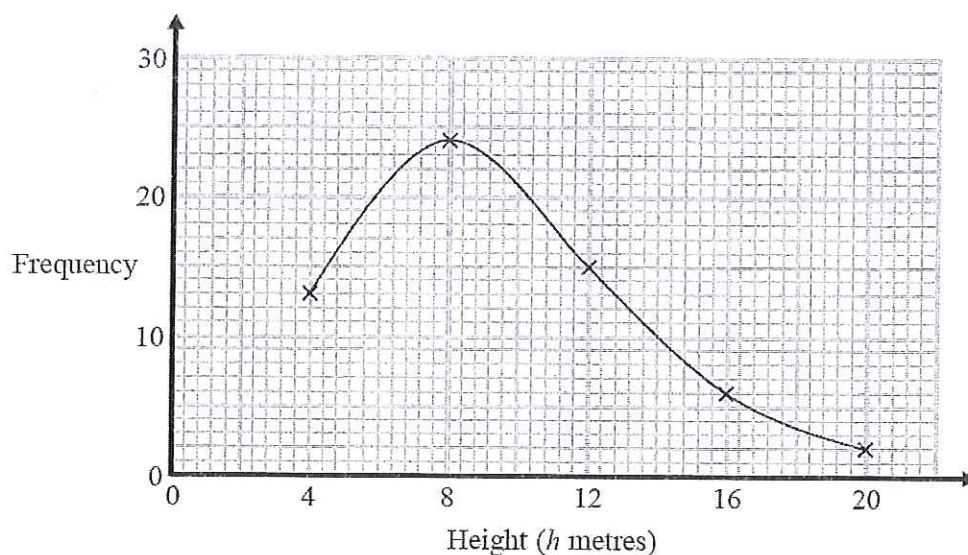
$$\frac{140}{385} \times 100 \%$$

(Total for Question 20 is 4 marks) 36.4%

- 21 The table shows information about the heights of 60 trees.

Height (h metres)	Frequency
$0 < h \leq 4$	13
$4 < h \leq 8$	24
$8 < h \leq 12$	15
$12 < h \leq 16$	6
$16 < h \leq 20$	2

Jacob drew this frequency polygon for the information in the table.
The frequency polygon is **not** correct.



Write down **two** things that are wrong with the frequency polygon.

1. points joined with a curve not line segments
2. points not plotted at midpoints

(Total for Question 21 is 2 marks)

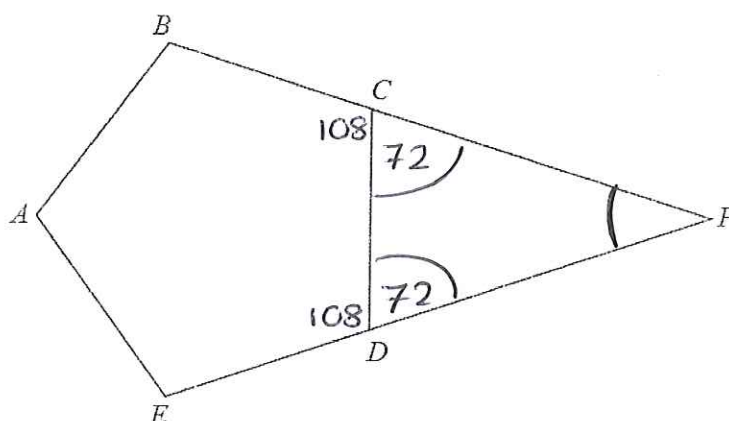
- 22 The price of all rail tickets increased by 5 %.
The price of a rail ticket from London to Ipswich increased by £2.30.

Work out the price of the ticket before the increase.

$$\begin{array}{l} \div 5 \left(\begin{array}{l} 5\% \\ 1\% \end{array} \right. \rightarrow 2.30 \left. \right) \div 5 \\ \times 100 \left(\begin{array}{l} 100\% \\ 46 \end{array} \right) \times 100 \end{array}$$

£ 46

(Total for Question 22 is 2 marks)



$ABCDE$ is a regular pentagon.
 BCF and EDF are straight lines.

Work out the size of angle CFD .
 You must show how you get your answer.

Interior angle of a pentagon

$$\frac{(\text{number of sides} - 2) \times 180}{\text{number of sides}}$$

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

So angles on a straight line add up to 180
 $180 - 108 = \underline{72}$

Third angle of triangle

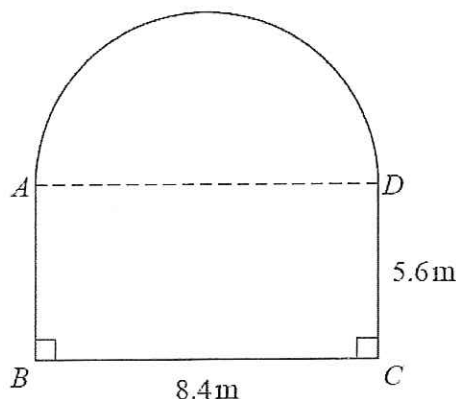
$$180 - 72 - 72 = 36$$

angles in a
 triangle add
 up to 180

36°

(Total for Question 23 is 3 marks)

- 24 A garden is in the shape of a rectangle, $ABCD$, and a semicircle.
 AD is the diameter of the semicircle.



Carol is going to cover the garden with fertiliser.

A box of fertiliser costs £4.99.

Carol has been told that one box of fertiliser will cover 12 m^2 of garden.

- (a) Work out the cost of buying enough fertiliser to cover the garden completely.

$$\text{Area of rectangle} = 8.4 \times 5.6 \\ = 47.04$$

$$\text{Area of semi-circle} = \frac{\pi r^2}{2} \\ = \frac{\pi \times 4.2^2}{2}$$

$$\begin{aligned} &= 27.6948 \\ \text{Area of whole shape} &= 47.04 + 27.6948 \\ &= 74.7348 \end{aligned}$$

$$\text{No of boxes} = \frac{74.7348}{12} = 6.2279 \quad \text{£ } 34.93$$

$$\text{Need 7 boxes} \quad 7 \times 4.99 = 34.93 \quad (5)$$

Carol finds out that one box of fertiliser will cover more than 12 m^2 of garden.

- (b) Explain how this might affect the number of boxes she needs to buy.

She may need to buy fewer boxes

(1)

(Total for Question 24 is 6 marks)

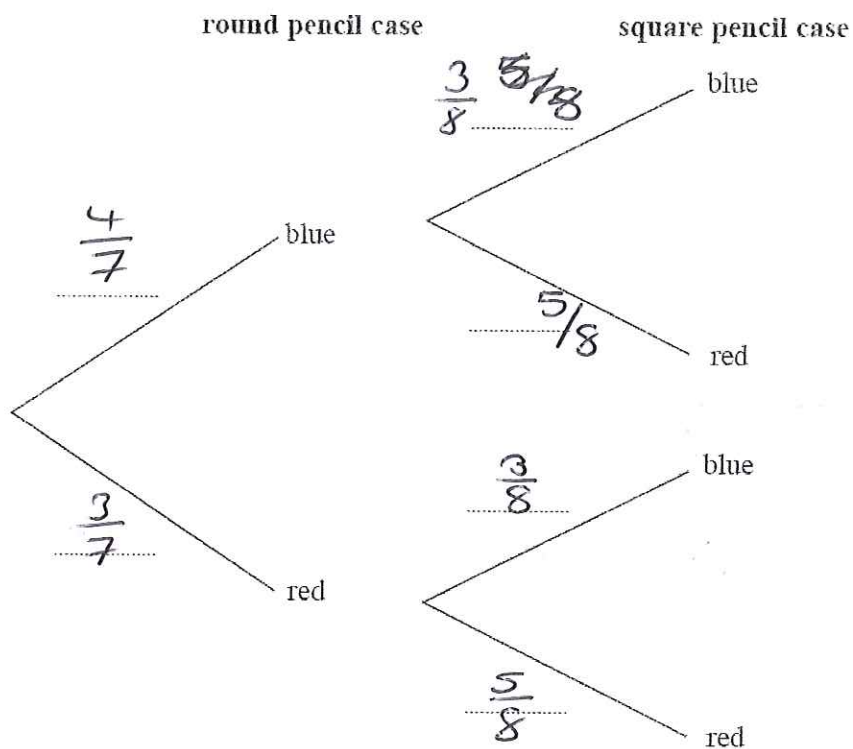
- 25 Sameena has a round pencil case and a square pencil case.

There are 4 blue pens and 3 red pens in the round pencil case.

There are 3 blue pens and 5 red pens in the square pencil case.

Sameena takes at random one pen out of each pencil case.

- (a) Complete the probability tree diagram.



(2)

- (b) Work out the probability that the pens Sameena takes are both red.

$$\frac{3}{7} \times \frac{5}{8} = \frac{15}{56}$$

$$\frac{15}{56}$$

(2)

(Total for Question 25 is 4 marks)

- 26 (a) Write 340 000 000 in standard form.

$$3.4 \times 10^8$$

$$3.4 \times 10^8$$

(1)

- (b) Work out $(1.6 \times 10^{-7}) \div (9.11 \times 10^{-3})$

Give your answer as an ordinary number correct to 3 significant figures.

$$\frac{1.6 \times 10^{-7}}{9.11 \times 10^{-3}}$$

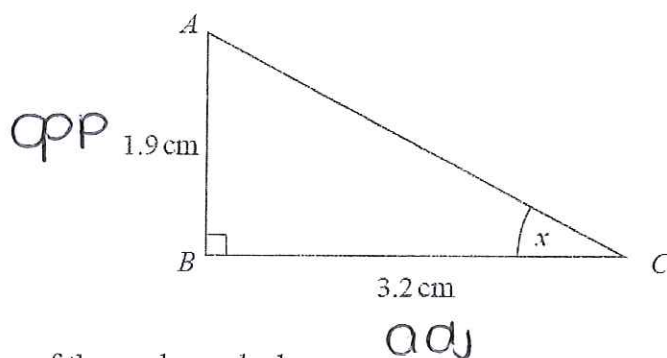
$$= \frac{0.00000016}{0.00911}$$

$$= 0.0000176$$

(2)

(Total for Question 26 is 3 marks)

27 ABC is a right-angled triangle.



Work out the size of the angle marked x .
Give your answer correct to 1 decimal place.



$$\tan \theta = \frac{1.9}{3.2}$$

$$\theta = 30.699722$$

$$\theta = \tan^{-1} \frac{1.9}{3.2}$$

$$\theta = 30.7^\circ$$

(Total for Question 27 is 2 marks)

TOTAL FOR PAPER: 80 MARKS