

Write your name here

Surname

Other names

**Pearson Edexcel**  
**Level 1/Level 2 GCSE (9 - 1)**

Centre Number

Candidate Number

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# Mathematics

## Paper 2 (Calculator)

*Model  
Solutions*

### Foundation Tier

Sample Assessment Materials – Issue 2

**Time: 1 hour 30 minutes**

Paper Reference

**1MA1/2F**

**You must have:** Ruler graduated in centimetres and millimetres, protractor, pair of compasses, pen, HB pencil, eraser, calculator.

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.**
- If your calculator does not have a  $\pi$  button, take the value of  $\pi$  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.

**Turn over** ►

**S48573A**

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- 5 There are some boys and girls in a classroom.

The probability of picking at random a boy is  $\frac{1}{3}$

What is the probability of picking a girl?

$$1 - \frac{1}{3} = \underline{\underline{\frac{2}{3}}}$$

2/3

(Total for Question 5 is 1 mark)

- 6 Jan writes down

one multiple of 9  
and two different factors of 40

Jan adds together her three numbers.

Her answer is greater than 20 but less than 30

Find three numbers that Jan could have written down.

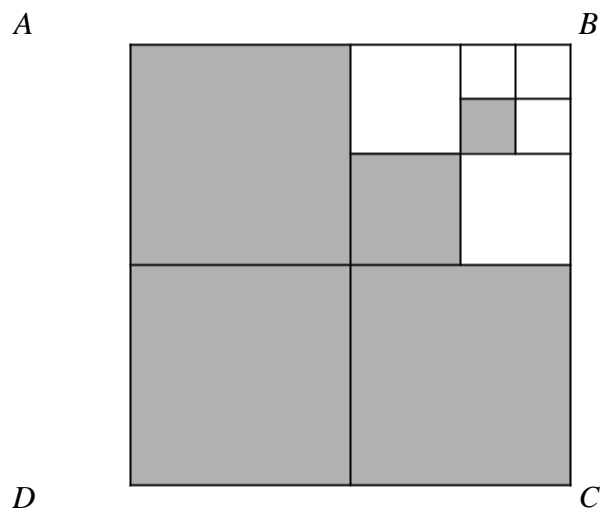
Multiples of 9  $\rightarrow$  9, 18, 27  
Factors of 40  $\rightarrow$  1, 2, 5, 8, 10, 20

$$18 + 2 + 5 = 25$$

$$20 < \boxed{25} < 30$$

(Total for Question 6 is 3 marks)

- 7  $ABCD$  is a square.  
This diagram is drawn accurately.



What fraction of the square  $ABCD$  is shaded?

$$\frac{3}{4} + \left(\frac{1}{4} \text{ of } \frac{1}{4}\right) + \left(\frac{1}{4} \text{ of } \frac{1}{4} \text{ of } \frac{1}{4}\right)$$

$$\frac{3}{4} + \frac{1}{16} + \frac{1}{64} = \underline{\underline{\frac{53}{64}}}$$

$$\underline{\underline{\frac{53}{64}}}$$

(Total for Question 7 is 2 marks)

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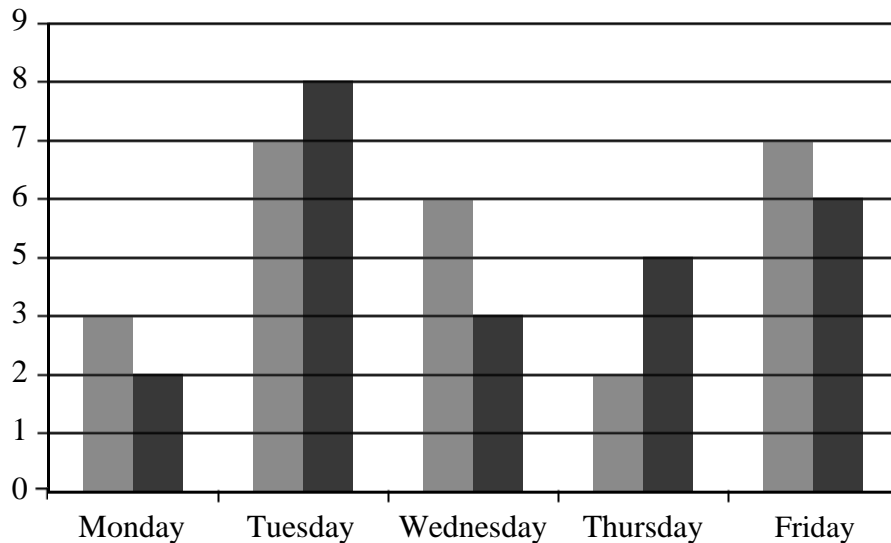
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8 Sam and Max work in a shop from Monday to Friday.

Sam draws a graph to show the number of TVs they each sell.



Write down **three** things that are wrong with this graph.

1. *No key to show which colour represents which worker.*
2. *No label on y-axis.*
3. *Missed number 4 on y-axis.*

(Total for Question 8 is 3 marks)

9 Here is a list of numbers

12 19 12 15 11 15 12 13 17

Find the median.

*11, 12, 12, 12, 13, 15, 15, 17, 19*

*Median = 13*

13

(Total for Question 9 is 2 marks)

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- 10 (a) Rob buys  $p$  packets of plain crisps and  $c$  packets of cheese crisps.

Write down an expression for the total number of packets of crisps Rob buys.

$$\underline{\underline{p + c}}$$

$$\frac{p + c}{(1)}$$

- (b) Solve  $3x - 5 = 9$

$$\begin{aligned} 3x - 5 &= 9 \\ 3x &= 14 \\ x &= \underline{\underline{14/3}} \end{aligned}$$

$$x = \frac{14}{3} \quad (2)$$

(Total for Question 10 is 3 marks)

- 11 Adam says,

“When you multiply an even number by an odd number the answer is always an odd number.”

- (a) Write down an example to show Adam is wrong.

$$\begin{aligned} 2 \times 5 &= 10 \\ \text{even} \times \text{odd} &= \text{even} \end{aligned} \quad (1)$$

Betty says,

“When you multiply two prime numbers together the answer is always an odd number.”

- (b) Betty is wrong.  
Explain why.

$$\begin{aligned} 2 \times 3 &= 6 \\ \text{prime} \times \text{prime} &= \text{even} \end{aligned} \quad (2)$$

(Total for Question 11 is 3 marks)

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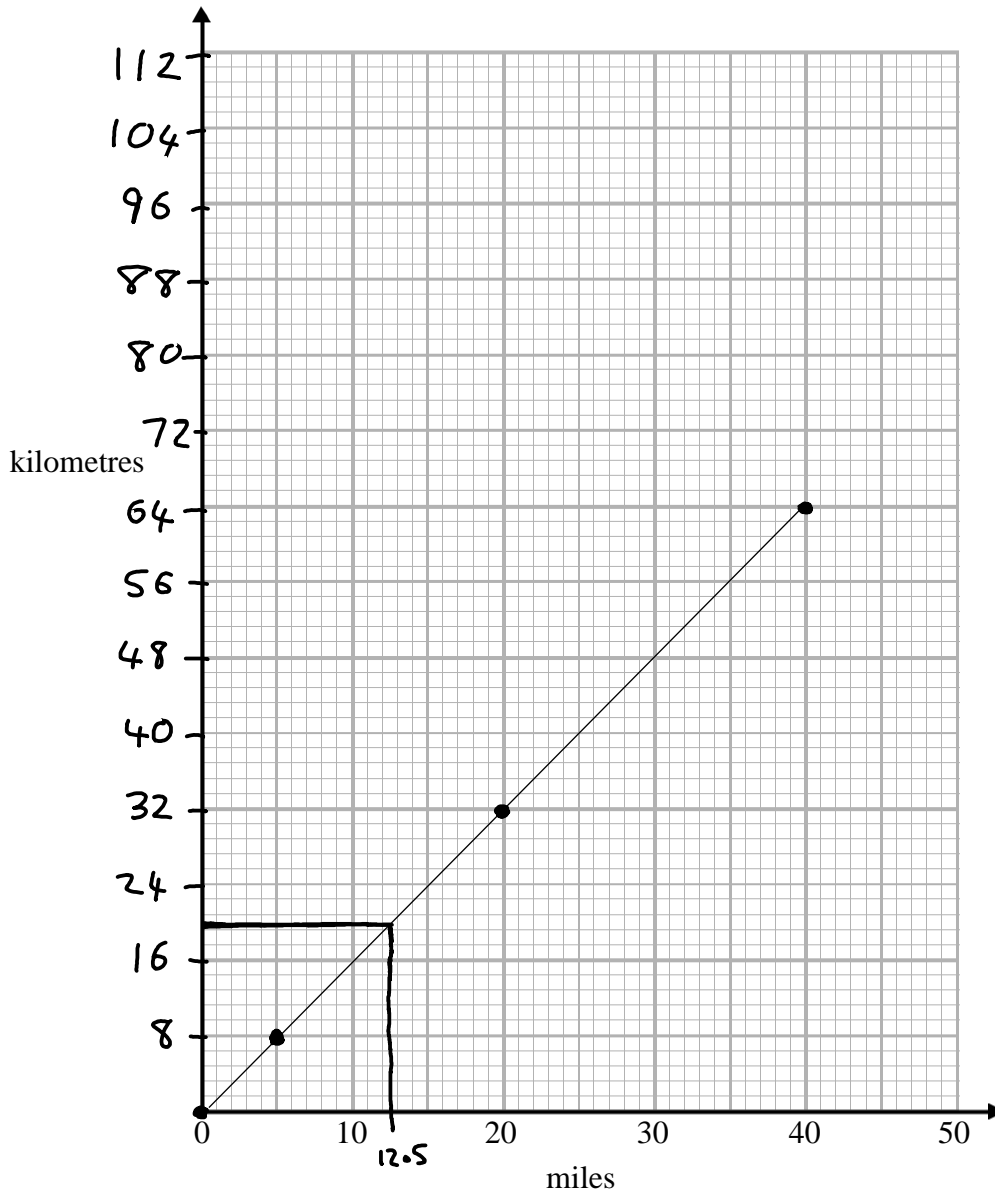
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12 You can use the information in the table to convert between kilometres and miles.

<b>miles</b>	0	5	20	40
<b>kilometres</b>	0	8	32	64

(a) Use this information to draw a conversion graph.



(3)

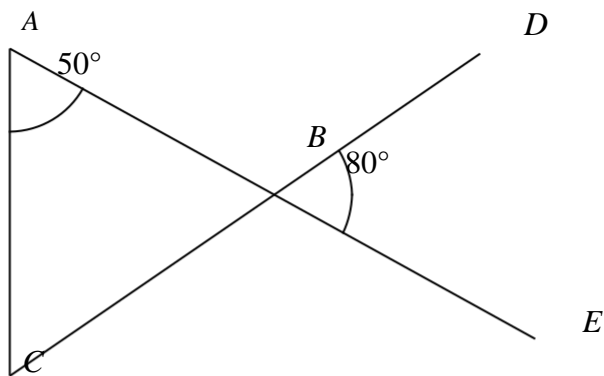
(b) Which is further, 20 kilometres or 15 miles?  
You must show how you got your answer.

$20 \text{ km} = 12.5 \text{ miles}$   
 $\text{So } 15 \text{ miles} > 12.5 \text{ miles}$   
 $\text{So } 15 \text{ miles} > 20 \text{ km}$

(2)

(Total for Question 12 is 5 marks)

13



$ABE$  and  $CBD$  are straight lines.

Show that triangle  $ABC$  is an isosceles triangle.

Give a reason for each stage of your working.

$$\begin{aligned} \angle ABC &= 80^\circ \text{ because vertically opposite angles are equal} \\ \angle ACB &= 180 - (80 + 50) = 180 - 130 = 50^\circ \\ &\text{because total angles in triangle add to } 180^\circ \end{aligned}$$

Since  $\angle ACB = \angle CAB$  triangle  $ABC$  is an isosceles because base angles in an isosceles triangle are equal.

(Total for Question 13 is 4 marks)

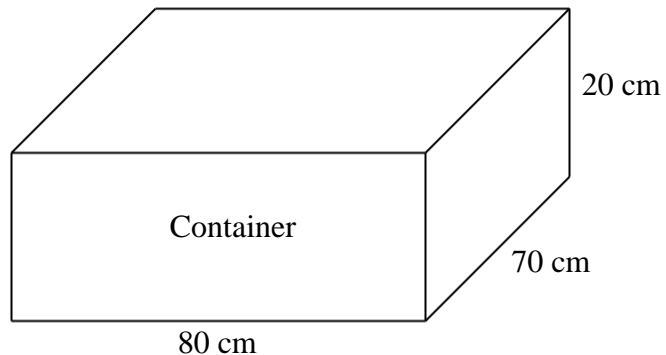
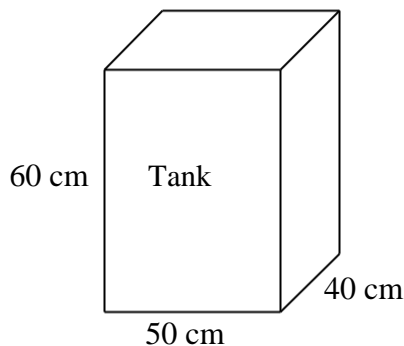
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- 14 The diagram shows a tank in the shape of a cuboid.  
It also shows a container in the shape of a cuboid.



The tank is full of oil.

The container is empty.

35% of the oil from the tank is spilled.

The rest of the oil from the tank is put into the container.

Work out the height of the oil in the container.

Give your answer to an appropriate degree of accuracy.

$$\text{Tank volume} = 50 \times 40 \times 60 = 120,000 \text{ cm}^3$$

$$35\% \text{ of } 120,000 \text{ spilled} \rightarrow 0.35 \times 120,000 = 42,000 \text{ cm}^3$$

$$120,000 - 42,000 = 78,000 \text{ poured into container.}$$

$$\text{Volume} = L \times W \times H$$

$$78,000 = 80 \times 70 \times H$$

$$\frac{78,000}{80 \times 70} = H = 13.9286 \text{ cm} = \underline{\underline{13.9 \text{ cm (1 dp)}}}$$

13.9

cm

(Total for Question 14 is 5 marks)

15 The diagram below represents two towns on a map.

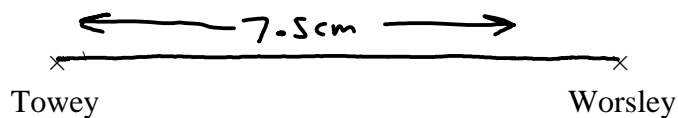


Diagram accurately drawn

Scale: 1 cm represents 3 kilometres.

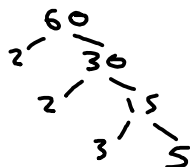
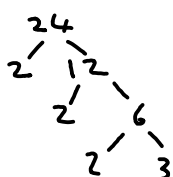
Work out the distance, in kilometres, between Towey and Worsley.

$$7.5 \times 3 = \underline{\underline{22.5 \text{ km}}}$$

..... 22.5 ..... km

(Total for Question 15 is 2 marks)

16 Find the Highest Common Factor (HCF) of 24 and 60



$$\textcircled{2} \times \textcircled{2} \times 2 \times \textcircled{3} = 24 \quad \textcircled{2} \times \textcircled{2} \times \textcircled{3} \times 5 = 60$$

$$2 \times 2 \times 3 = \underline{\underline{12}}$$

..... 12 .....

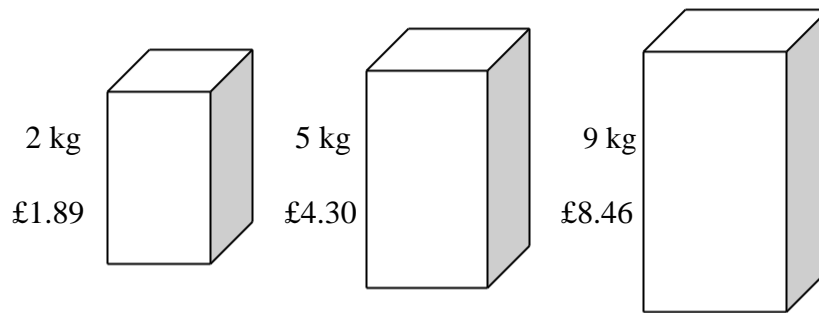
(Total for Question 16 is 2 marks)

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17 Soap powder is sold in three sizes of box.



A 2 kg box of soap powder costs £1.89

A 5 kg box of soap powder costs £4.30

A 9 kg box of soap powder costs £8.46

Which size of box of soap powder is the best value for money?

You must show how you get your answer.

$$£1.89 \div 2 = £0.945 \text{ per kg}$$

$$£4.30 \div 5 = £0.860 \text{ per kg}$$

$$£8.46 \div 9 = £0.94 \text{ per kg}$$

5 kg box is best value for money.

(Total for Question 17 is 3 marks)

18  $f = 5x + 2y$   
 $x = 3$  and  $y = -2$

Find the value of  $f$ .

$$f = 5x + 2y$$

$$\text{Sub in } x \text{ and } y \text{ values} \rightarrow 5(3) + 2(-2) = 15 - 4 = \underline{\underline{11}}$$

..... 11 .....

(Total for Question 18 is 2 marks)

19 Jane made some almond biscuits which she sold at a fete.

She had:

5 kg of flour

3 kg of butter

2.5 kg of icing sugar

320 g of almonds

Here is the list of ingredients for making 24 almond biscuits.

Ingredients for 24 almond biscuits

150 g flour

100 g butter

75 g icing sugar

10 g almonds

Jane made as many almond biscuits as she could, using the ingredients she had.

Work out how many almond biscuits she made.

$$\text{Flour } \frac{5000}{150} = 33.\dot{3} \text{ batches}$$

$$\text{Butter } \frac{3000}{100} = 30 \text{ batches}$$

$$\text{Icing Sugar } \frac{2500}{75} = 33.\dot{3} \text{ batches}$$

$$\text{Almonds } \frac{320}{10} = 32 \text{ batches.}$$

The amount she can make is limited by the amount of butter she has.  
 So she can only make 30 batches of 24 biscuits.

$$30 \times 24 = \underline{\underline{720}} \text{ biscuits}$$

..... 720 .....

(Total for Question 19 is 3 marks)

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20 (a) Factorise  $3f+9$

$$\underline{\underline{3(f+3)}}$$

$$\underline{3(f+3)}$$
  
(1)

(b) Factorise  $x^2 - 2x - 15$

$$x^2 - 2x - 15 \rightarrow (x+3)(x-5)$$

$$\begin{aligned} 3 \times -5 &= -15 \\ 3 + -5 &= -2 \end{aligned}$$

$$\underline{(x+3)(x-5)}$$
  
(2)

(Total for Question 20 is 3 marks)

21  $q = \frac{p}{r} + s$

Make  $p$  the subject of this formula.

$$q = \frac{p}{r} + s \rightarrow q - s = \frac{p}{r} \rightarrow r(q - s) = p \rightarrow \underline{\underline{p = rq - rs}}$$

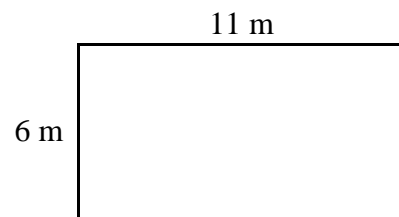
$$\underline{p = rq - rs}$$

(Total for Question 21 is 2 marks)

22 A tin of varnish costs £15

A rectangular floor has dimensions 6 m by 11 m.

The floor is going to be covered in varnish.



Helen assumes that each tin of this varnish covers an area of  $12 \text{ m}^2$ .

(a) Using Helen's assumption, work out the cost of buying the varnish for this floor.

$$6 \times 11 = 66 \text{ m}^2 \text{ floor area}$$

$$\frac{66}{12} = 5.5 \text{ tins} \rightarrow \text{So } 6 \text{ tins needed}$$

$$6 \times £15 = \underline{\underline{£90}}$$

£ 90 (4)

Helen finds that each tin of varnish covers less than  $12 \text{ m}^2$ .

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

If each tin covers less area she might need to buy more tins.

(1)

(Total for Question 22 is 5 marks)

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- 23 Frank, Mary and Seth shared some sweets in the ratio 4 : 5 : 7  
Seth got 18 more sweets than Frank.

Work out the total number of sweets they shared.

$$F : M : S$$

$$4 : 5 : 7 = 16 \text{ total parts}$$

$$\text{Seth} - \text{Frank} \text{ is } 7 - 4 = 3 \text{ parts} = 18$$

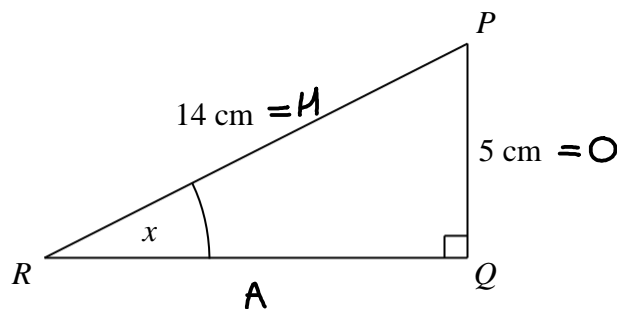
$$\text{So now we know each part} = 6$$

$$16 \times 6 = \underline{\underline{96}}$$

96

(Total for Question 23 is 3 marks)

- 24  $PQR$  is a right-angled triangle.



Work out the size of the angle marked  $x$ .

Give your answer correct to 1 decimal place.

Use SOH because we know opposite and Hypotenuse values.

$$\sin x = 5/14$$

$$x = \sin^{-1}(5/14) = \underline{\underline{20.9^\circ}}$$

20.9

(Total for Question 24 is 2 marks)

25 Here are the first four terms of an arithmetic sequence.

6      10      14      18

(a) Write an expression, in terms of  $n$ , for the  $n$ th term of this sequence.

Goes up in 4's so  $4n$ .  
Number before 6 is 2 so  $4n+2$ .

$$\frac{4n+2}{(2)}$$

The  $n$ th term of a different arithmetic sequence is  $3n + 5$

(b) Is 108 a term of this sequence?

Show how you get your answer.

$$\begin{aligned} 108 &= 3n + 5 \\ 103 &= 3n \\ \frac{103}{3} &= n \end{aligned}$$

No,  $n$  is not a whole number so 108 not in sequence.

(2)

(Total for Question 25 is 4 marks)

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26 Axel and Lethna are driving along a motorway.

They see a road sign.

The road sign shows the distance to Junction 8

It also shows the average time drivers take to get to Junction 8

To Junction 8 30 miles 26 minutes
---

The speed limit on the motorway is 70 mph.

Lethna says

“We will have to drive faster than the speed limit to drive 30 miles in 26 minutes.”

Is Lethna right?

You must show how you get your answer.



$$\text{Speed} = \frac{\text{Distance}}{\text{Time}} \rightarrow \frac{30 \text{ miles}}{26/60 \text{ hours}} = 69.2 \text{ mph}$$

$$69.2 < 70 \text{ mph}$$

So she is incorrect. Will not have to drive over speed limit.

(Total for Question 26 is 3 marks)

27 The table shows some information about the foot lengths of 40 adults.

Foot length ( $f$ cm)	Number of adults
16 $\ll f < 18$	3
18 $\ll f < 20$	6
20 $\ll f < 22$	10
22 $\ll f < 24$	12
24 $\ll f < 26$	9

(a) Write down the modal class interval.

$22 \leq f < 24$

$22 \leq f < 24$   
(1)

(b) Calculate an estimate for the mean foot length.

Foot length  $\times$  number of adults

$17 \times 3 = 51$   
 $19 \times 6 = 114$   
 $21 \times 10 = 210$   
 $23 \times 12 = 276$   
 $25 \times 9 = 225$

mean  $\rightarrow \frac{51 + 114 + 210 + 276 + 225}{40}$   
 $= \underline{21.9 \text{ cm}}$   
21.9 cm  
 (3)

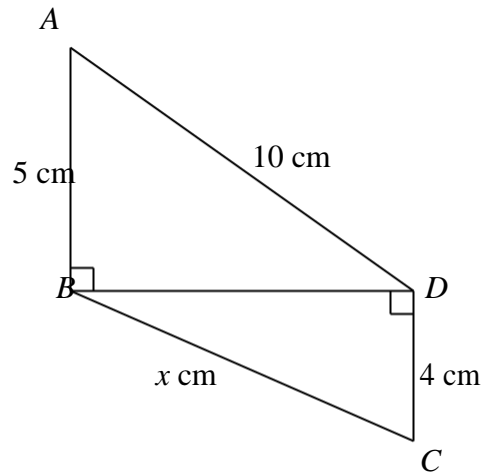
(Total for Question 27 is 4 marks)

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28 Triangles  $ABD$  and  $BCD$  are right-angled triangles.



Work out the value of  $x$ .

Give your answer correct to 2 decimal places.

$$10^2 - 5^2 = (BD)^2$$

$$100 - 25 = 75 = (BD)^2$$

$$\underline{BD = \sqrt{75}}$$

$$x^2 = (\sqrt{75})^2 + 4^2$$

$$x^2 = 75 + 16$$

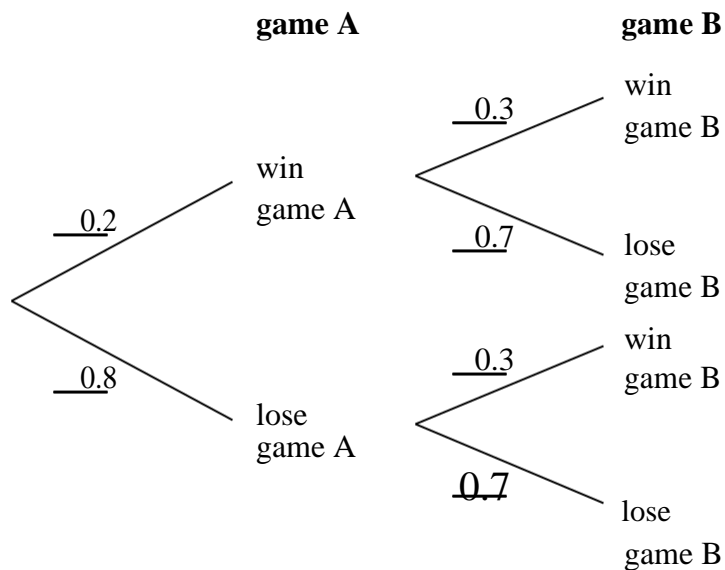
$$x^2 = 91$$

$$x = \underline{\underline{\sqrt{91} = 9.54 \text{ cm } 2 \text{ dp}}}$$

9.54

(Total for Question 28 is 4 marks)

29 Here is a probability tree diagram.



Work out the probability of winning both games.

$$0.2 \times 0.3 = \underline{\underline{0.06}}$$

0.06

(Total for Question 29 is 2 marks)

**TOTAL FOR PAPER IS 80 MARKS**