

Write your name here

Surname	Other names
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Centre Number Candidate Number

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Mathematics

Paper 2 (Calculator)

Foundation Tier

Sample Assessment Materials – Issue 2 Time: 1 hour 30 minutes	Paper Reference 1MA1/2F
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You must have: Ruler graduated in centimetres and millimetres, protractor, pair of compasses, pen, HB pencil, eraser, calculator.

	Total Marks
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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.

Turn over ►

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PEARSON

Answer ALL questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

1 Write down the value of the 3 in the number 4376

300

(Total for Question 1 is 1 mark)

2 (a) Write $\frac{7}{16}$ as a decimal.

0.4375

(Total for Question 2 is 1 mark)

3 Here is a list of numbers

4 7 9 25 27 31 64

From the numbers in the list, write down a cube number.

27 [or 64]

(Total for Question 3 is 1 mark)

4 Find the value of $(2.8 - 0.45)^2 + \sqrt[3]{5.832}$

7.3225

(Total for Question 4 is 2 marks)

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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?

$\frac{2}{3}$

(Total for Question 5 is 1 mark)

6 Jan writes down

one multiple of 9 9, 18, [27]
and two different factors of 40

1, 2, 4, 5, 8, 10, [20, 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.

18, 1, 2

18, 2, 4

9, 10, 2

18, 1, 4

18, 2, 5

9, 10, 4

18, 1, 5

18, 2, 8

9, 10, 5

18, 1, 8

18, 4, 5

9, 10, 8

18, 1, 10

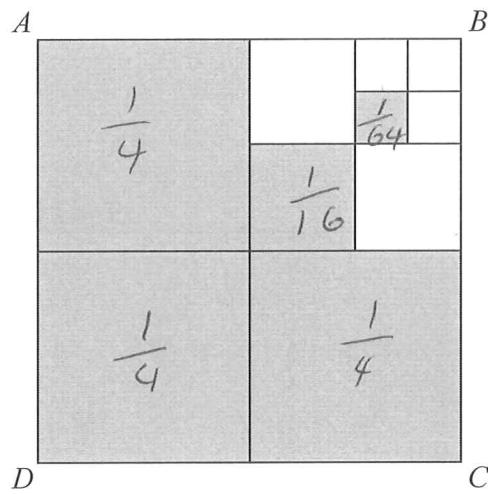
9, 8, 5

9, 8, 4

18, 1, 2

(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?

$$\frac{1}{4} + \frac{1}{4} + \frac{1}{4} + \frac{1}{16} + \frac{1}{64}$$

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

(Total for Question 7 is 2 marks)

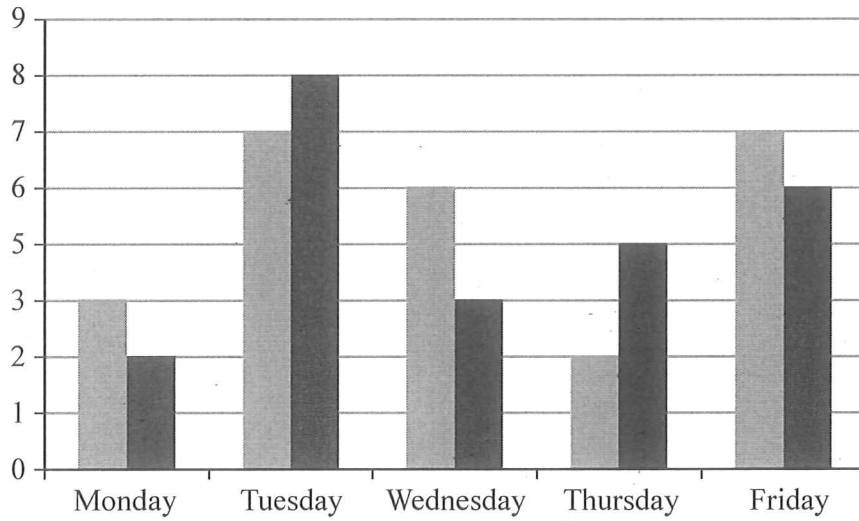
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8 Sam and Max work in a shop from Monday to Friday.

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



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

1 There is no key

2 4 is missing off of the scale

3 There is no label for the y axis

(Total for Question 8 is 3 marks)

9 Here is a list of numbers

$\frac{12}{11}$ $\frac{19}{12}$ $\frac{12}{13}$ $\frac{15}{12}$ $\frac{11}{13}$ $\frac{15}{15}$ $\frac{12}{15}$ $\frac{13}{17}$ $\frac{17}{19}$

Find the median.

13

(Total for Question 9 is 2 marks)

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.

$$p + c$$

(1)

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

$$\begin{aligned} &+5 \quad +5 \\ 3x &= 14 \\ x &= \frac{14}{3} \end{aligned}$$

$$x = \frac{14}{3}$$

(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.

$$2 \times 3 = 6$$

(1)

Betty says,

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

(b) Betty is wrong.
Explain why.

2 is a prime number. All multiples of 2 are even.

(2)

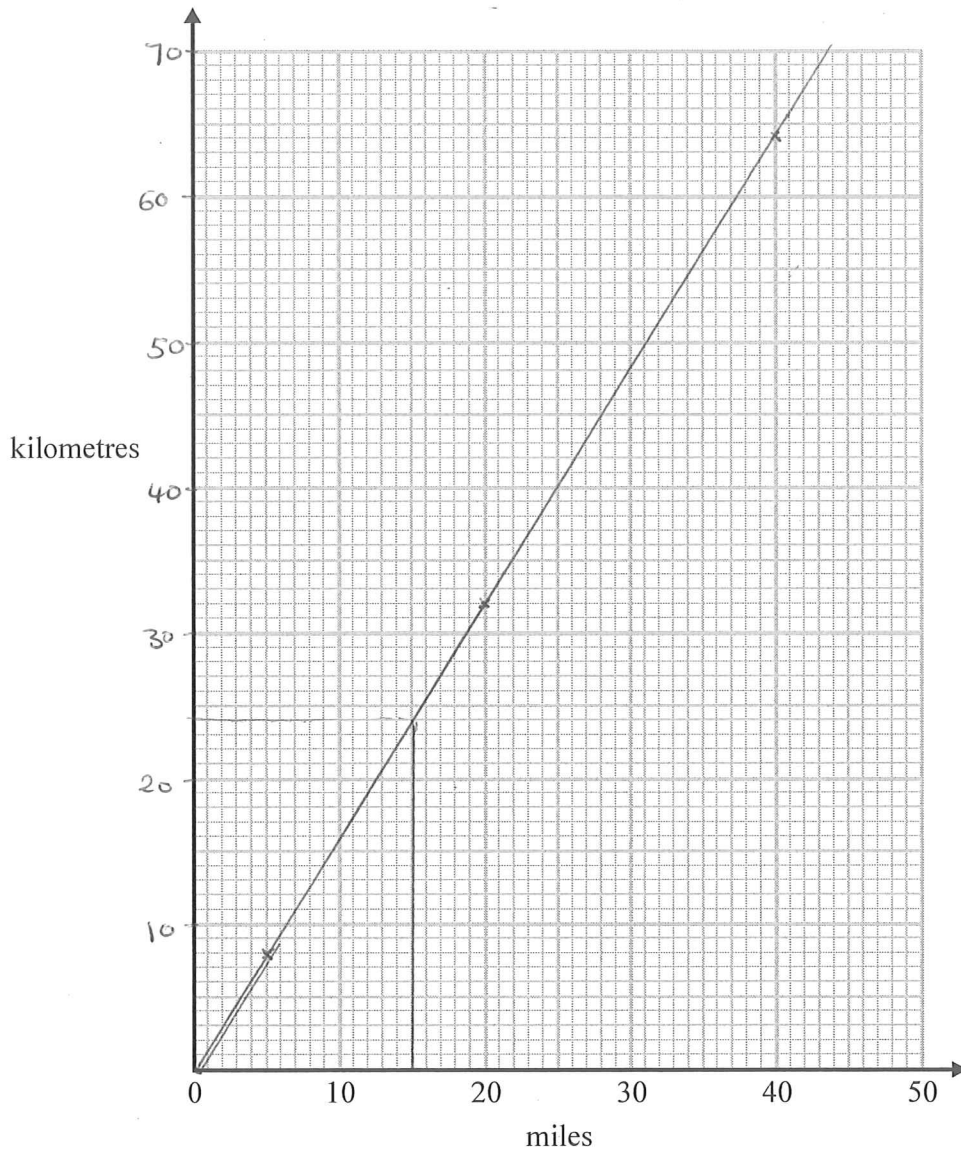
(Total for Question 11 is 3 marks)

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

miles	0	5	20	40
kilometres	0	8	32	64

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



(3)

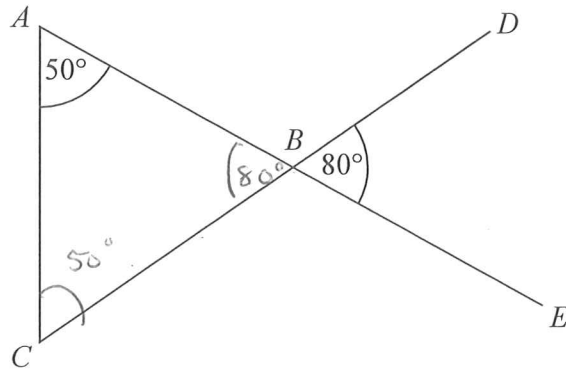
(b) Which is further, 20 kilometres or 15 miles?
You must show how you got your answer.

15 miles = 24 km
15 miles is further.

(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.

$\angle ABC = 80^\circ$ vertically opposite angles are equal

$\angle ACB = 50^\circ$ Angles in a triangle sum to 180

ABC is isosceles because $\hat{BAC} = \hat{ACB}$
(2 equal angles)

(Total for Question 13 is 4 marks)

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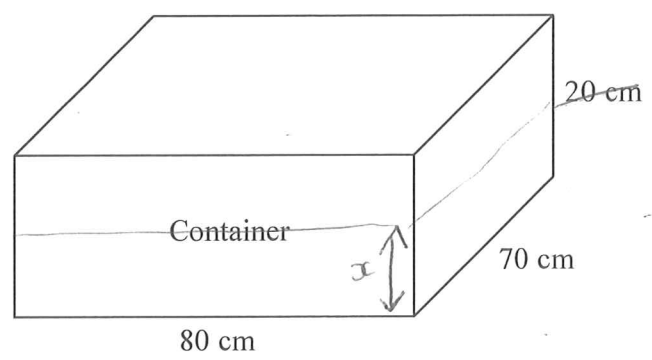
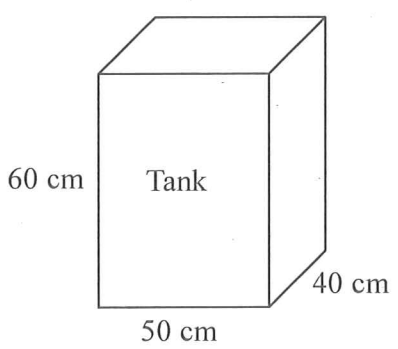
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14 The diagram shows a tank in the shape of a cuboid.
It also shows a container in the shape of a cuboid.



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.

$$\begin{aligned} \text{volume of tank} &= 60 \times 50 \times 40 \\ &= 120000 \text{ cm}^3 \end{aligned}$$

$$\begin{aligned} 35\% \text{ spilled} & \quad 0.65 \times 120000 \\ & = 78000 \text{ cm}^3 \end{aligned}$$

$$80 \times 70 \times x = 78000$$

$$x = \frac{78000}{80 \times 70}$$

$$= 13.9 \text{ cm (3sf)}$$

14 cm nearest whole no.
.....14..... cm

(Total for Question 14 is 5 marks)

15 The diagram below represents two towns on a map.

Diagram
accurately drawn

×
Towey

×
Worsley

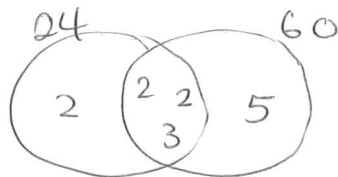
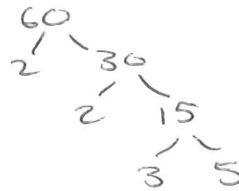
Scale: 1 cm represents 3 kilometres.

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

~~7.25 cm~~ 7.3 cm
~~7.25 × 3~~ 7.3 × 3 =
 7.25 cm 21.9 km
 7.25 × 3
 = 21.75 km 21.75 km

(Total for Question 15 is 2 marks)

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

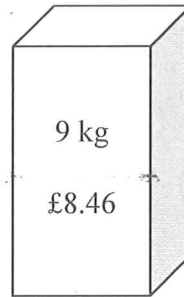
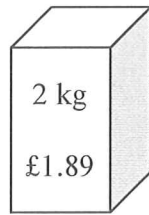


$2 \times 2 \times 3 = 12$

12

(Total for Question 16 is 2 marks)

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.

$$\begin{array}{r|l|l} \frac{189}{2} & & \frac{430}{5} & & \frac{846}{9} \\ \hline = 94.5\text{p/kg} & & = \underline{\underline{86\text{p/kg}}} & & = 94\text{p/kg} \end{array}$$

The 5kg box is the 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 .

$$f = 5(3) + 2(-2)$$

$$= 11$$

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 5000 g
 3 kg of butter 3000 g
 2.5 kg of icing sugar 2500 g
 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.

F: $\frac{5000}{150} = 33.3$ $33.3 \times 24 = 800$ biscuits

B: $\frac{3000}{100} = 30$ $30 \times 24 = 720$ biscuits

IS: $\frac{2500}{75} = 33.3$ $33.3 \times 24 = 800$ biscuits

A: $\frac{320}{10} = 32$ $32 \times 24 = 768$ biscuits

720

(Total for Question 19 is 3 marks)

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20 (a) Factorise $3f+9$

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

(1)

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

$$(x-5)(x+3)$$

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

(2)

(Total for Question 20 is 3 marks)

21 $q = \frac{p}{r} + s$ Make p the subject of this formula.

$$q - s = \frac{p}{r}$$

$$r(q - s) = p$$

$$\boxed{qr - rs = p}$$

$$\underline{p = r(q - s)}$$

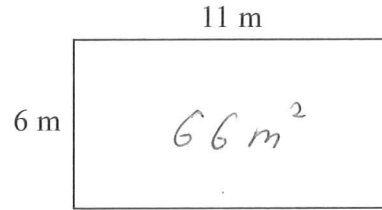
(Total for Question 21 is 2 marks)

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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 m^2 .

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

$$\begin{aligned} 5 \times 12 &= 60 \\ 6 \times 12 &= 72 \\ \text{She needs } &6 \text{ tins} \end{aligned}$$

$$6 \times 15 = 90$$

$$\begin{array}{r} \text{£ } 90 \\ \hline (4) \end{array}$$

Helen finds that each tin of varnish covers less than 12 m^2 .

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

She may need to buy more
tins

(1)

(Total for Question 22 is 5 marks)

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F M S

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

16 parts

Work out the total number of sweets they shared.

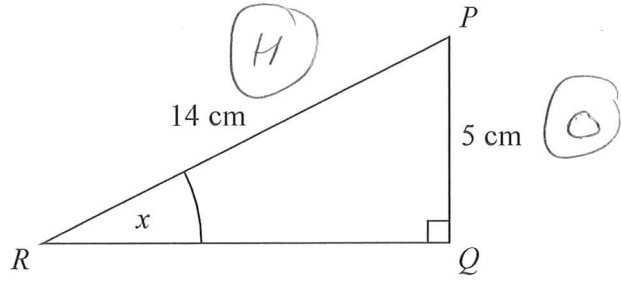
3 parts = 18
1 part = 6

6 x 16 = 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.

$\sin x = \frac{5}{14}$
 $\sin x = \frac{5}{14}$
 $x = \sin^{-1}\left(\frac{5}{14}\right)$

20.9°

(Total for Question 24 is 2 marks)

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

6 10 14 18
 $4n$ 4 8 12 16

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

$$4n + 2$$

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

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.

$$3n + 5 = 108$$

$$3n = 103$$

$$n = \frac{103}{3} \text{ (not a whole no.)}$$

108 is not in the 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.

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

$$\text{distance} = 30 \text{ (miles)} \quad \text{time} = \frac{26}{60} \text{ (hours)}$$

$$\text{speed} = \frac{30}{26/60} = \underline{\underline{69.2 \text{ mph}}}$$

Lethna is not right.

(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
$16 \leq f < 18$	3
$18 \leq f < 20$	6
$20 \leq f < 22$	10
$22 \leq f < 24$	12
$24 \leq f < 26$	9

40

51

114

210

276

225

876

(a) Write down the modal class interval.

$22 \leq f < 24$

(1)

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

$$\frac{876}{40} = 21.9$$

21.9

cm

(3)

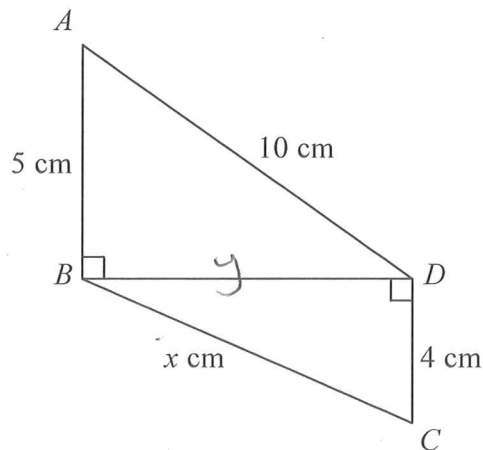
(Total for Question 27 is 4 marks)

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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.

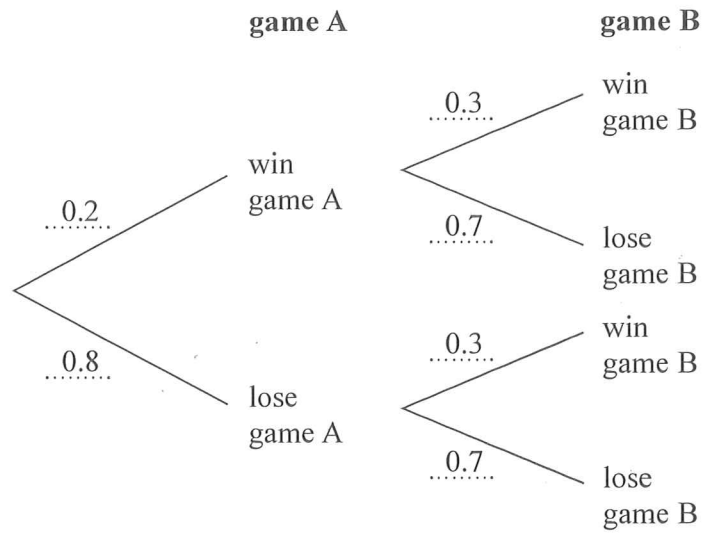
$$\begin{aligned} 5^2 + y^2 &= 10^2 \\ 25 + y^2 &= 100 \\ y^2 &= 75 \\ y &= \sqrt{75} \end{aligned}$$

$$\begin{aligned} (\sqrt{75})^2 + 4^2 &= x^2 \\ 75 + 16 &= x^2 \\ 91 &= x^2 \\ x &= \sqrt{91} \\ &= 9.54 \text{ 2dp} \end{aligned}$$

9.54

(Total for Question 28 is 4 marks)

29 Here is a probability tree diagram.



Work out the probability of winning both games.

$$0.2 \times 0.3 = 0.06$$

0.06

(Total for Question 29 is 2 marks)

TOTAL FOR PAPER IS 80 MARKS