OCR
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GCSE (9–1) Mathematics

J560/01 Paper 1 (Foundation Tier)

Practice Paper

Date – Morning/Afternoon

Time allowed: 1 hour 30 minutes

You may use:
- A scientific or graphical calculator
- Geometrical instruments
- Tracing paper

First name	JustMaths
Last name	Solutions
Centre number	
Candidate number	

INSTRUCTIONS
- Use black ink. You may use an HB pencil for graphs and diagrams.
- Complete the boxes above with your name, centre number and candidate number.
- Answer **all** the questions.
- Read each question carefully before you start your answer.
- Where appropriate, your answers should be supported with working. Marks may be given for a correct method even if the answer is incorrect.
- Write your answer to each question in the space provided.
- Additional paper may be used if required but you must clearly show your candidate number, centre number and question number(s).
- Do **not** write in the bar codes.

INFORMATION
- The total mark for this paper is **100**.
- The marks for each question are shown in brackets **[ ]**.
- Use the π button on your calculator or take π to be 3.142 unless the question says otherwise.
- This document consists of **24** pages.

Answer **all** the questions

1 Leah asked some people about their favourite type of holiday.
The pictogram shows her results.

Beach	4 4 4
Walking	4 4 2
Cruising	4 4 4 4 4 2
Adventure	4 4 4 4
Sightseeing	4 4 2
Other	4 4 4 1

Key : ☐ represents 4 people.

(a) How many people answered Beach?

(a) 12 ..... **[1]**

(b) 10 people answered Sightseeing.

Show this on the pictogram. **[1]**

(c) How many **more** people answered Cruising than Other?

22 13

22 - 13

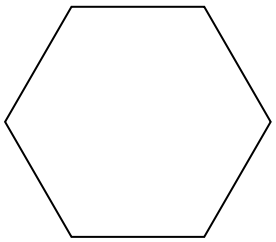
(c) 9 ..... **[1]**

(d) How many people were asked altogether?

12 + 10 + 22 + 16 + 10 + 13

(d) 83 ..... **[2]**

2 **(a)** Write down the mathematical name of this shape.



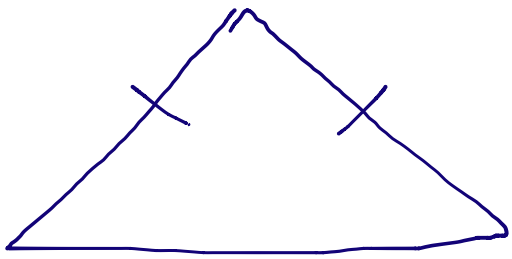
(a) Hexagon **[1]**

(b) How many vertices does a cube have?

(b) 8 **[1]**

(c) Sketch an isosceles triangle.

Mark the triangle to show that it is isosceles. **[1]**



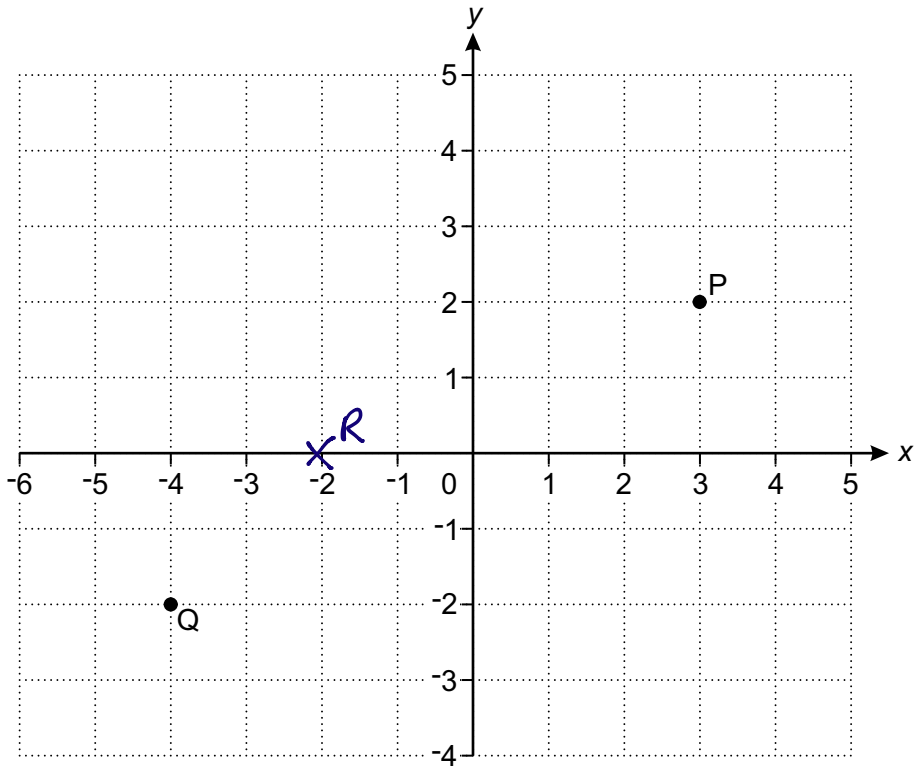
3 Write the following numbers in order of size, smallest first.

60.6	6.601	6.106	0.6	6.060
5	4	3	1	2

0·6 ..... 6·06 ..... 6·106 ..... 6·601 ..... 60·6 ..... **[2]**

smallest

4 Points P and Q are shown on this grid.



(a) **(i)** Write down the coordinates of point P.

(a)(i) (3 , 2) **[1]**

(ii) Write down the coordinates of point Q.

(ii) (-4 , -2) **[1]**

(b) Plot point R at (-2, 0). ✓ **[1]**

1, 2, 3, 4, 5, 6 H, T

5 A game is played by rolling a fair ordinary dice and throwing a fair coin.

(a) List all the possible outcomes.

Dice	Coin
1	H
1	T
→ 2	H
2	T
3	H
3	T
→ 4	H
4	T
5	H
5	T
→ 6	H
6	T

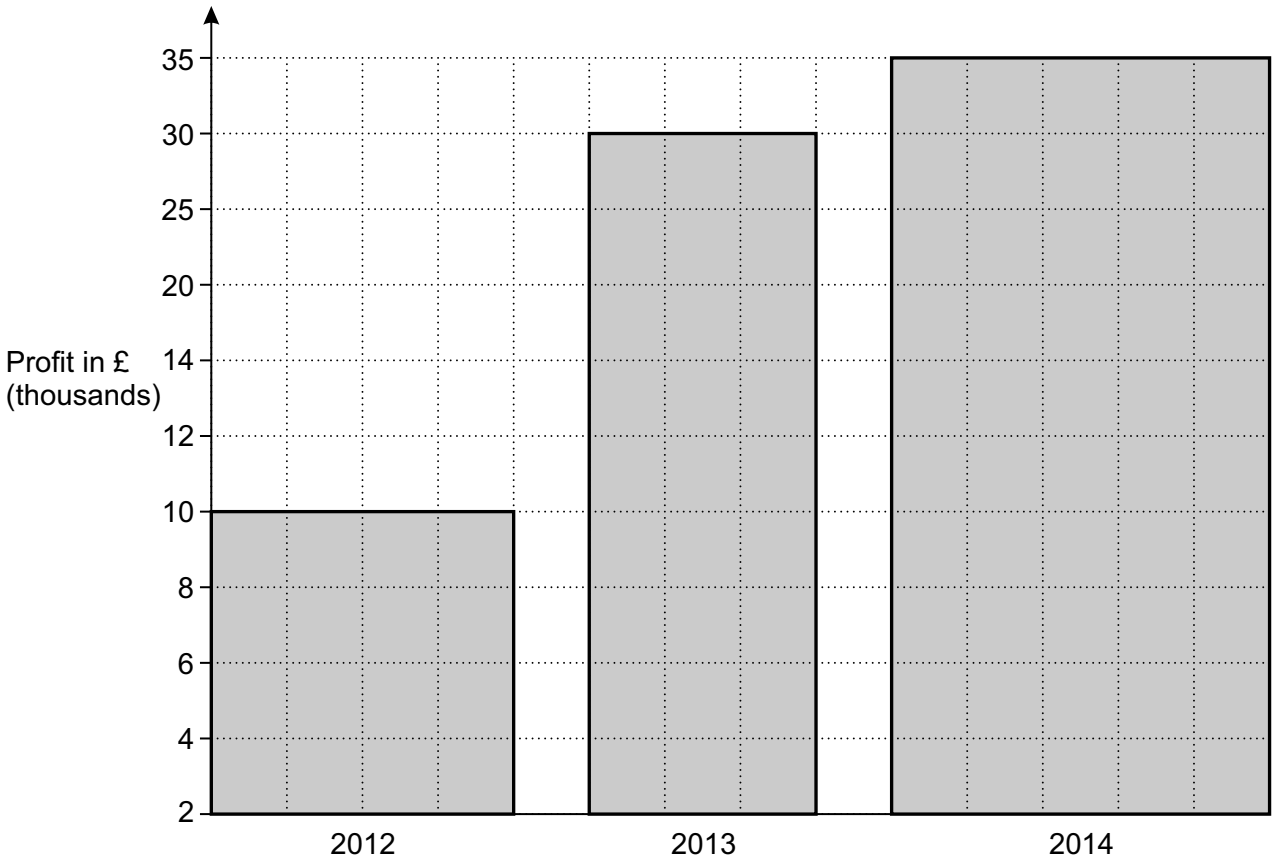
[2]

(b) Natalie wins if she gets an even number and a head.

What is the probability she wins?

(b) $\frac{3}{12} = \frac{1}{4}$ ..... **[1]**

6 This chart shows a firm's profit for each of 3 years.



Give **two** reasons why the chart is misleading.

Reason 1 the profit scale doesn't start at zero and isn't linear

.....

Reason 2 The "bars" are different widths

..... **[2]**

7 **(a)** Simplify.

$a \times a \times a \times a \times a$

(a) a^5 **[1]**

(b) Solve.

$3x + 7 = 19$

$-7 \quad -7$

$\frac{3x}{3} = \frac{12}{3}$

(b) $x =$ 4 **[2]**

(c) Here is a formula.

$T = 5r + 3u$

Work out the value of T when $r = 8$ and $u = 9$.

$T = 5 \times 8 + 3 \times 9$

$= 40 + 27$

(c) $T = 67$ **[2]**

8 **(a)** **(i)** Write 1.85 metres in centimetres.

(a)(i) 185 cm **[1]**

(ii) Write 2086 grams in kilograms.

(ii) 2.086 kg **[1]**

(b) In a box of 12 eggs, 5 are cracked.

What fraction is cracked?

(b) $\frac{5}{12}$ **[1]**

(c) **(i)** Write 45 : 15 as a ratio in its simplest form.

(c)(i) 3 : 1 **[1]**

(ii) Divide 32 in the ratio 5 : 3.

32 : 8 = 4

5 × 4 = 20 3 × 4 = 12

(ii) 20 12 **[3]**

(d) The price of a watch is £230.
In a sale this price is reduced by 16%.

Calculate the sale price.

10% = 23
1% = 2.30
5% = 11.50

23
2.30
11.50
36.80

230.00
36.80
193.20

(d) £ 193.20 **[3]**

9 **(a)** Round 27 146 correct to

(i) the nearest ten,

(a)(i) 27,150 **[1]**

(ii) the nearest thousand.

(ii) 27000 **[1]**

(b) The width of a bench, b, is 984.8 cm correct to one decimal place.

Write down the error interval for the width of the bench.

UB 984.85

984.8 to 1dp 0.1 → 0.05

LB 984.75

(b) 984.75 ⩽ b < 984.85 **[2]**

(c) **(i)** Write 856 000 000 in standard form.

(c)(i) 8.56×10^8 **[1]**

(ii) Write 4.31×10^{-3} as an ordinary number.

(ii) 0.00431 **[1]**

(d) Work out.

$\sqrt[3]{27} + \sqrt{25}$ = 3+5

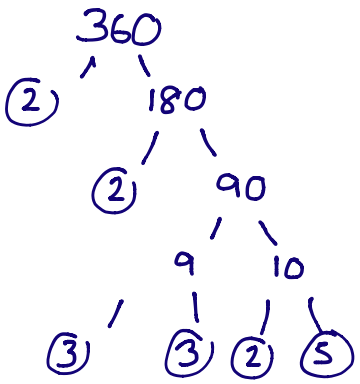
3x3x3 5x5

(d) 8 **[2]**

10 **(a)** Write down a factor of 15.

any of
(a) 1, 15, 3 or 5 **[1]**

(b) Write 360 as the product of its prime factors.



(b) $2^3 \times 3^2 \times 5$ **[2]**

(c) Gary's alarm and Ian's alarm both bleep at 7:50 am.
Then Gary's alarm bleeps every 6 minutes and Ian's alarm bleeps every 4 minutes.

What is the next time both alarms bleep together?

6mins
7:50
7:56
8:02

4 mins
7:50
7:54
7:58
8:02

(c) 8:02 am **[4]**
OR 08:02

BIDMAS

11 **(a)** Put brackets in these calculations to make them correct.

(i) $(5 - 3) \times (12 \div 4) = 6$ **[1]**

(ii) $6 \times (4 + 3)^2 - 5 = 289$ **[1]**

$6 \times 7^2 - 5$

$6 \times 49 - 5$

$294 - 5 = 289$

(b) Calculate.

$$\frac{7.5 \times 3.4}{15.2 - 12.8}$$

Give your answer correct to 2 decimal places.

$\frac{25.5}{2.4} = 10.625$

(b) 10.63 ..... **[2]**

12 Katy organised a wedding.
Guests had to choose their meal from pasta, chicken or beef.

- $\frac{1}{3}$ of the guests chose pasta.
- $\frac{5}{12}$ of the guests chose chicken.
- 24 of the guests chose beef.

How many guests were at the wedding?

P C B

24

$\frac{1}{3}$ $\frac{5}{12}$ $\boxed{\frac{3}{12}}$

$\frac{1}{3} + \frac{5}{12}$

$\frac{4}{12} + \frac{5}{12} = \frac{9}{12}$ $1 - \frac{9}{12} = \frac{3}{12}$

$\frac{3}{12} = 24$

$\frac{1}{4} = 24$

24×4

$= 96$

$\begin{array}{r} 24 \\ \times 4 \\ \hline 96 \\ {\scriptstyle 1} \end{array}$

96 ..... **[4]**

13 Bridget took a maths test. She scored 28 marks out of 40.
Sam took an English test. He scored 32 marks out of 47.

Sam said

I did better than Bridget as I scored more marks.

By writing each score as a percentage, show that Sam is wrong. **[3]**

Bridget → maths $\frac{28}{40}$

$\frac{28}{40} \times 100$

70%

Sam → English $\frac{32}{47}$

$\frac{32}{47} \times 100$

$= 68.085106$

$= 68.1\%$

Bridget scored a higher percentage

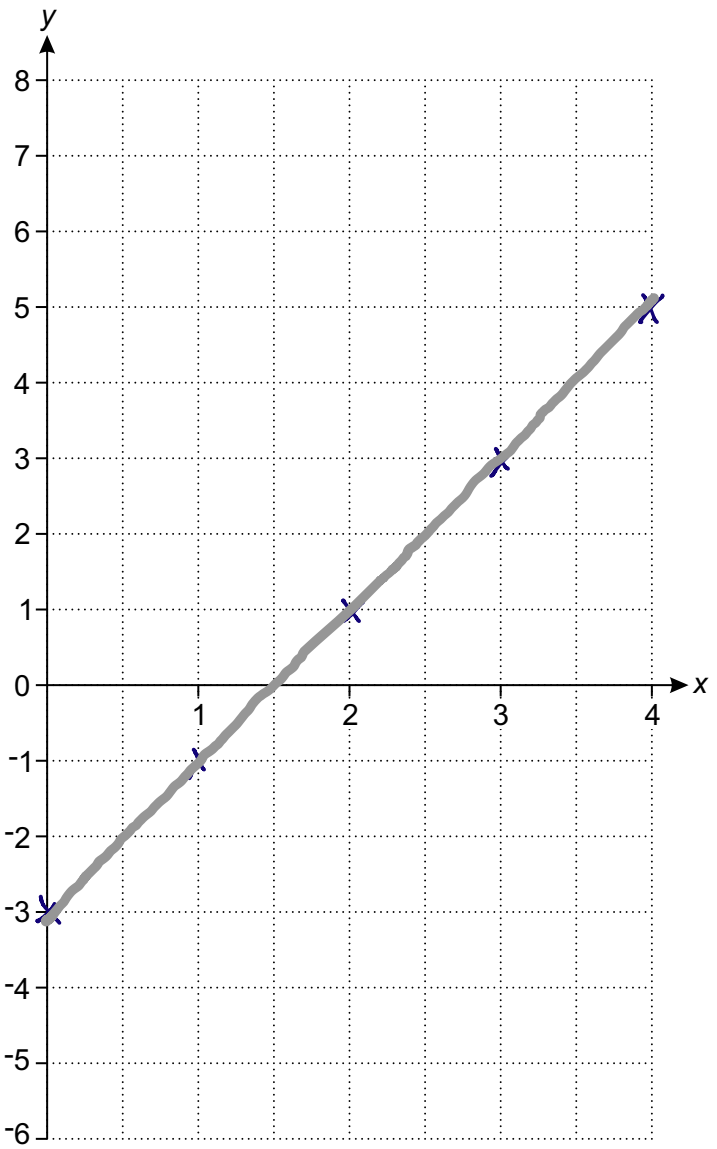
14 **(a)** Complete this table for $y = 2x - 3$.

x	0	1	2	3	4
y	-3	-1	1	3	5

$2 \times 1 - 3$ $2 \times 3 - 3$

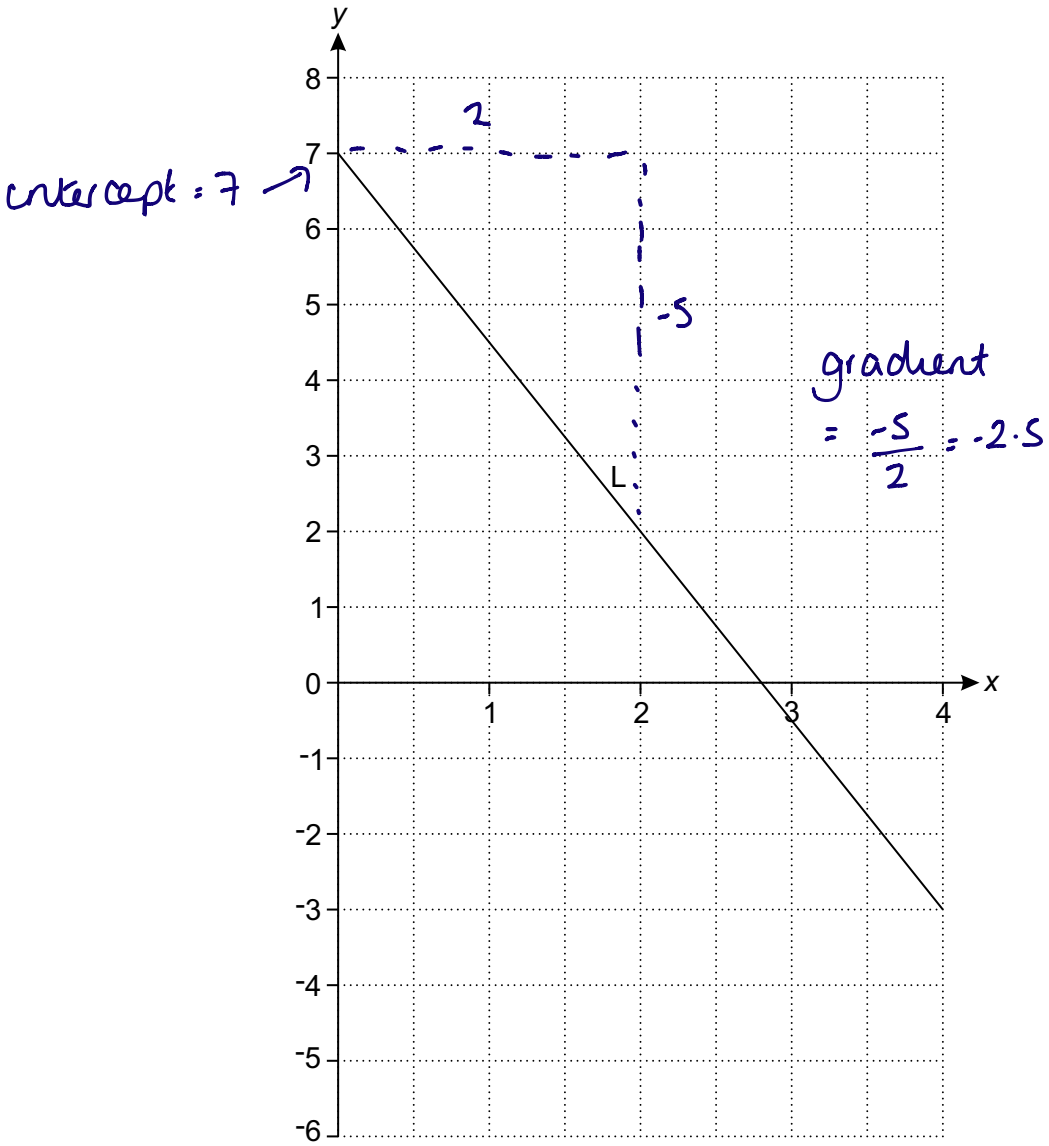
[1]

(b) On the grid below, draw the graph of $y = 2x - 3$ for values of x from 0 to 4.



[2]

(c) Line L is drawn on the grid below.



Work out the equation of line L.

$y = -2.5x + 7$

(c) $y = -2.5x + 7$ **[3]**

15 Eddie and Caroline are going to the school play.

Eddie buys 6 adult tickets and 2 child tickets. He pays £39.
Caroline buys 5 adult tickets and 3 child tickets. She pays £36.50.

Work out the cost of an adult ticket and the cost of a child ticket.

$6a + 2c = 39$ -①
$5a + 3c = 36.50$ -②

① × 3
② × 2

$18a + 6c = 117$
$10a + 6c = 73$
$8a = 44$
$a = \frac{44}{8} = £5.50$

sub into ① $6 \times 5.50 + 2c = 39$
$2c = 39 - 33$
$= 6$
$c = 6/2$
$= £3$

Adult ticket £ 5.50

Child ticket £ 3.00 **[5]**

16 Show that $3r = 2(5k^2 - 2r)$ can be rearranged to $k = \sqrt{\frac{7r}{10}}$. **[4]**

$3r = 2(5k^2 - 2r)$

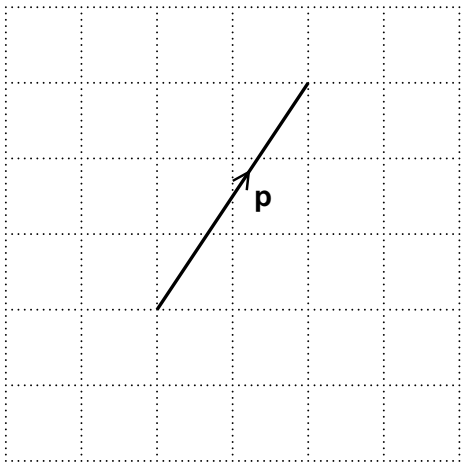
$= 10k^2 - 4r$

$3r + 4r = 10k^2$

$\frac{7r}{10} = k^2$

$k = \sqrt{\frac{7r}{10}}$

17 (a) Vector **p** is shown on a unit grid.



Write **p** as a column vector.

(a) $\begin{pmatrix} 2 \\ 3 \end{pmatrix}$ **[1]**

(b) $\mathbf{q} = \begin{pmatrix} -2 \\ 4 \end{pmatrix}$ $\mathbf{r} = \begin{pmatrix} 5 \\ -3 \end{pmatrix}$

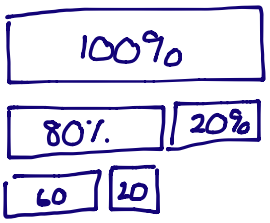
Work out $\mathbf{q} + \mathbf{r}$.

$\begin{pmatrix} -2+5 \\ 4+-3 \end{pmatrix}$ $\begin{matrix} 3 \\ 1 \end{matrix}$

(b) $\begin{pmatrix} 3 \\ 1 \end{pmatrix}$ **[2]**

18 A shop has a sale that offers 20% off all prices.
On the final day they reduce all sale prices by 25%.
Alex buys a hairdryer on the final day.

Work out the **overall** percentage reduction on the price of the hairdryer.



overall percentage reduction
= 40%

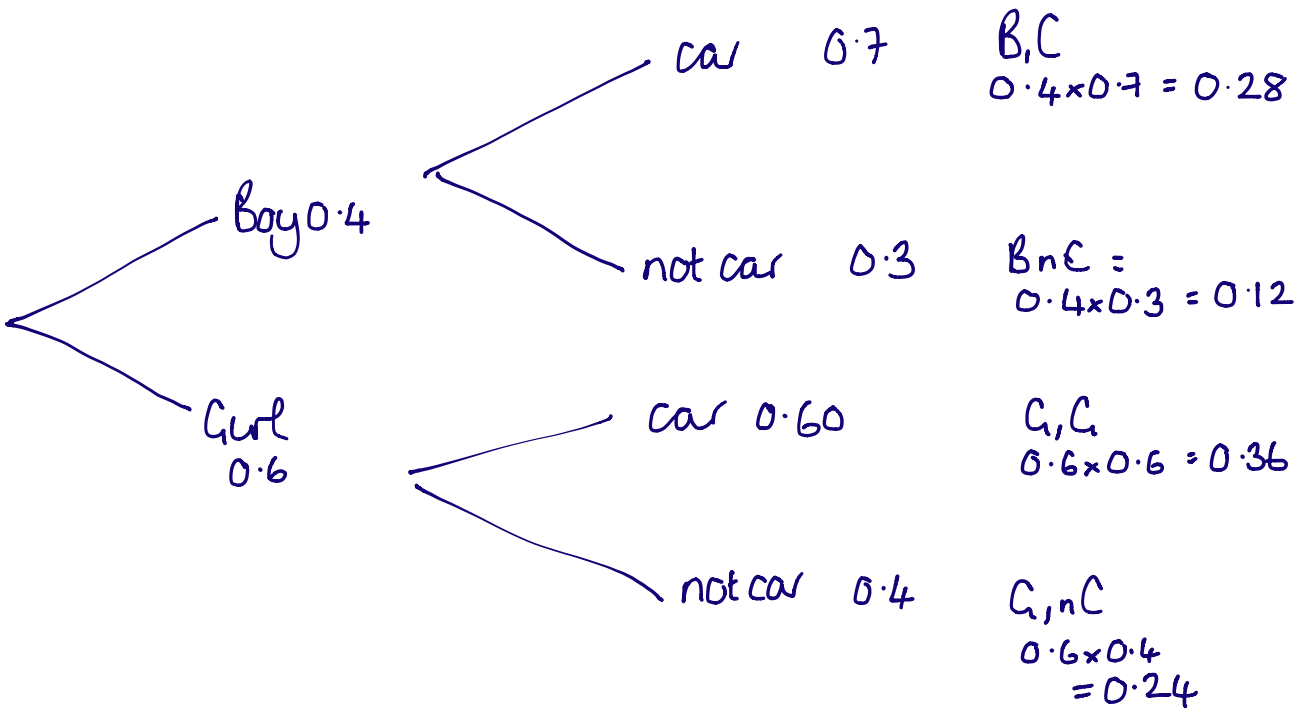
check:
100 - 20% = 80
80 - 20 = 60
100 - 60 = 40

40 ..... % **[6]**

19 Some of the children at a nursery arrive by car.

- 40% of the children at the nursery are boys.
- 70% of the boys at the nursery arrive by car.
- 60% of the girls at the nursery arrive by car.

What is the probability that a child chosen at random from the nursery arrives by car?

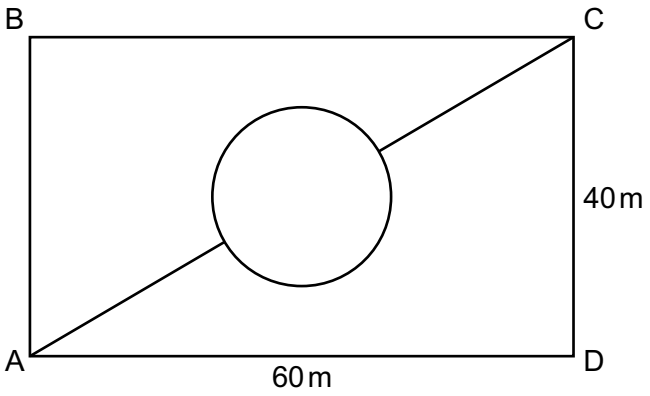


P(G,C OR B,C)

= 0·28 + 0·36

0·64 ..... **[5]**

20 The rectangle ABCD represents a park.



Not to scale

The lines show all the paths in the park.
The circular path is in the centre of the rectangle and has a diameter of 10 m.

Calculate the shortest distance from A to C across the park, using only the paths shown.

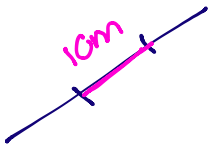
Circumference = $\pi \times 10$

$\frac{1}{2}$ circle = 5π

Length $AC^2 = 60^2 + 40^2$

$AC = \sqrt{5200}$

$= 72.11102551$

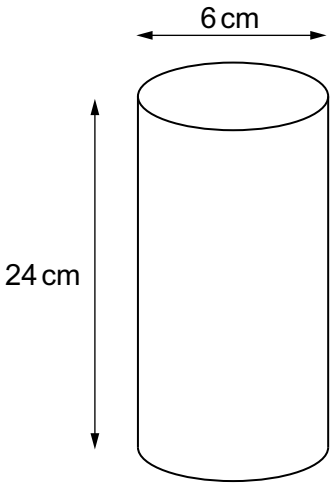


Shortest distance

$= 72.11 - 10 + 5\pi =$

77.82 (2dp) ..... m **[6]**

21 Four solid balls are packed in a cylindrical container.



radius = 3

area = $\pi \times 3^2$
$= 9\pi$

Volume = $9\pi \times 24$
$= 216\pi$

The diameter of each ball is 6 cm.
The cylinder has diameter 6 cm and height 24 cm.

Calculate the volume of unused space in the cylinder.

[The volume V of a sphere is $V = \frac{4}{3}\pi r^3$ where r is the radius.]

1 Ball $V = \frac{4}{3} \times \pi \times 3^3 = 36\pi$

4 Balls $= 36\pi \times 4 = 144\pi$

unused space $= 216\pi - 144\pi$
$= 72\pi$
$= 226.1946711$

226.2 (1dp) ..... cm^3 **[6]**