**Answer ALL questions.**

**Write your answers in the spaces provided.**

**You must write down all the stages in your working.**

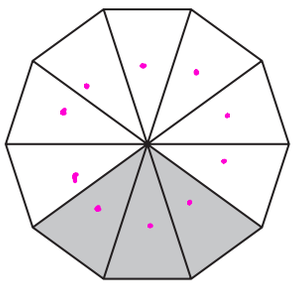
**1** Write 38% as a decimal.

$\frac{38}{100}$ fraction

0·38

**(Total for Question 1 is 1 mark)**

**2** What fraction of this shape is shaded?



10 in total

3 shaded

$\frac{3}{10}$

**(Total for Question 2 is 1 mark)**

**3** Here is a list of numbers.

1.6 1.4 2.1 0.5 1.3

From the list, write down the smallest number.

0·5

**(Total for Question 3 is 1 mark)**

**4** Work out $-9 + 5$


-4

**(Total for Question 4 is 1 mark)**

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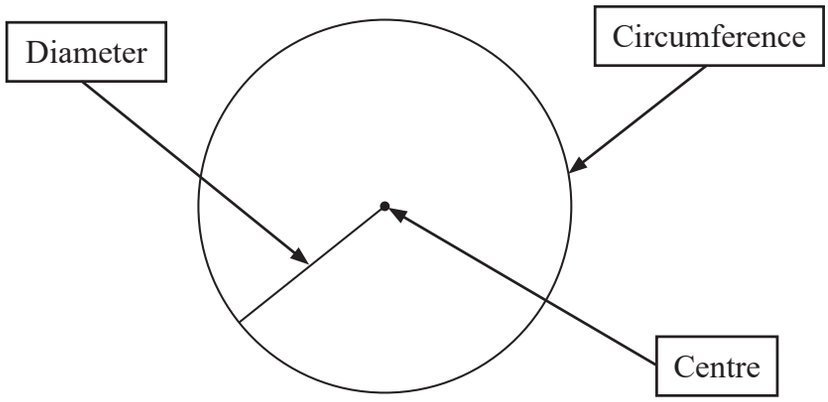
**5** Solve $p - 2 = 3$

5 - 2 = 3
so p = 5

$p =$ 5

**(Total for Question 5 is 1 mark)**

**6** Freddie adds labels to this diagram of a circle.




Explain why one of the labels is wrong.

the diameter should read 'radius', the diameter would be a line through the centre from one point to another on the circle.

**(Total for Question 6 is 1 mark)**

7 Write down **three** different factors of 20

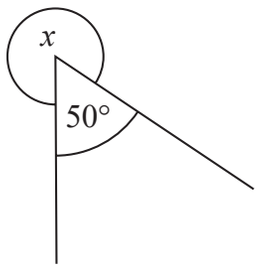
1, 20
2, 10
4, 5
~~5, 4~~

← any 3 of these numbers

1 , 2 , 4

**(Total for Question 7 is 2 marks)**

8




(a) Work out the size of the angle marked $x$.

angles around a point add up to 360

360 - 50

310 °

**(2)**

A student says that an angle of 50° is an obtuse angle.

The student is wrong.

(b) Explain why.

An angle of 50° is an acute angle

**(1)**

**(Total for Question 8 is 3 marks)**

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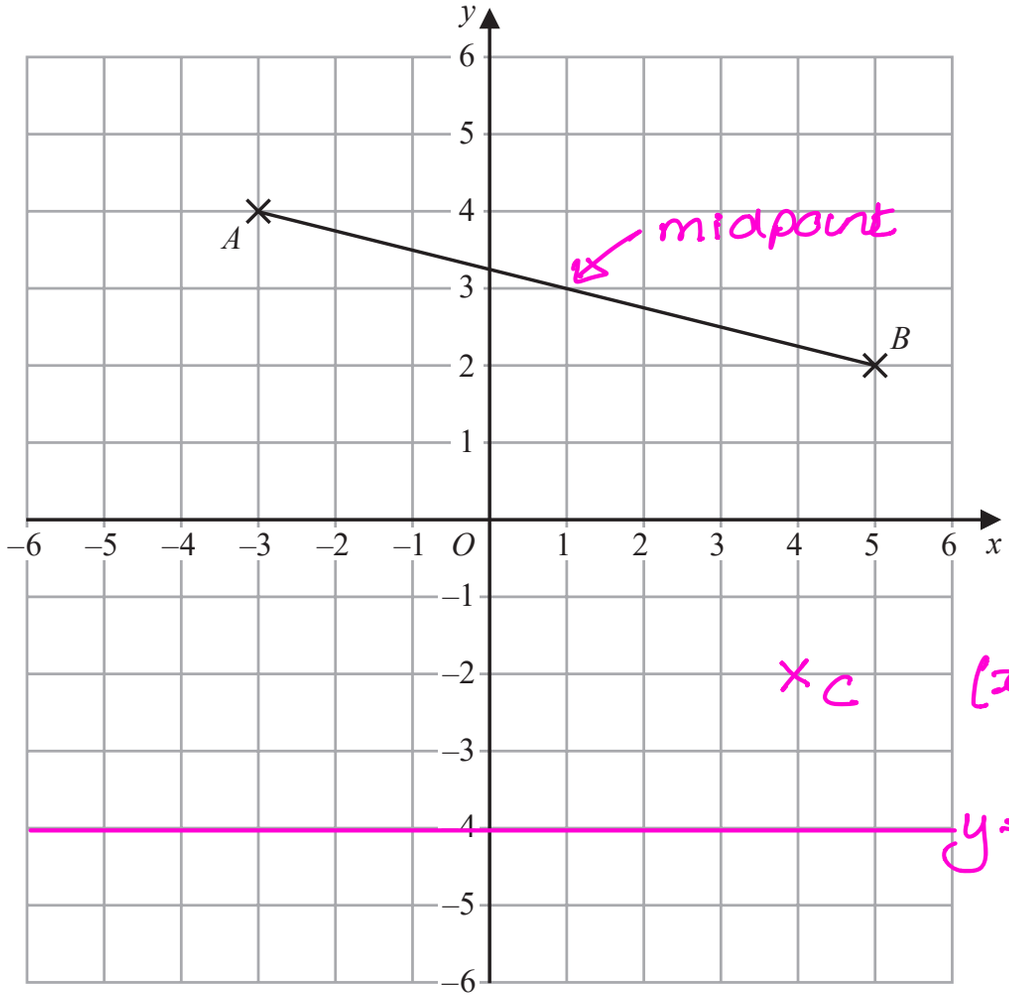
**9**




(a) Write down the coordinates of point $B$.

( 5 , 2 )

**(1)**

(b) Plot the point with coordinates (4, –2)
Label this point $C$.

**(1)**

(c) Write down the coordinates of the midpoint of $AB$.

( 1 , 3 )

**(1)**

(d) Draw the line with equation $y = -4$

**(1)**

**(Total for Question 9 is 4 marks)**

**10** Max sees this special offer in a shop.

> Buy one large plate and get one small plate for half the normal price.

The normal price of a large plate is £2
The normal price of a small plate is 80p

Max wants to buy 6 large plates and 6 small plates using this offer.
He has £15

Has Max got enough money?
You must show how you get your answer.

Large.

6 x 2

= £12

Small

6 x 40p

= £2.40

Total = £14.40

Yes, Max has enough money

14.40 < 15

**(Total for Question 10 is 4 marks)**

**11** A total of 700 tickets were on sale for a football match.

452 of the tickets were sold.

(a) How many tickets were **not** sold?

$$\begin{array}{r} {}^{6}\cancel{7}{}^{9}\cancel{0}{}^{1}0 \\ -\ 452 \\ \hline 248 \end{array} \qquad \begin{array}{r} 248 \\ +\ 452 \\ \hline 700 \end{array} \checkmark \quad \leftarrow \text{check}$$

248

**(2)**

For a different football match,

297 tickets were sold for £9.50 each.
399 tickets were sold for £19.50 each.

(b) Work out an estimate for the total amount of money paid for these tickets.
You must show all your working.

297 ↑ → 300 ; 9.50 each ↑ → £10

399 ↑ → 400 ; 19.50 each ↑ → £20

$10 \times 300 = 3000$

$400 \times 20 = 8000$

Total = 3000 + 8000

£ 11000

**(3)**

(c) Is your answer to part (b) an underestimate or an overestimate?
Give a reason for your answer.

overestimate, because all the numbers have been rounded up

**(1)**

**(Total for Question 11 is 6 marks)**

**12** Here are 6 numbers.

13 + 5 + 4 + 9 + 3 + 8

18 22 31 34 42

Work out the mean.

42 ÷ 6 = 7

7

**(Total for Question 12 is 2 marks)**

**13** (a) Simplify $\frac{15a}{3}$

15 ÷ 3 = 5

5a

**(1)**

(b) Simplify $19 + 5b + 4c - 7b + c$

19 + 5b - 7b + 4c + c

19 -2b + 5c

19 - 2b + 5c

**(2)**

(c) Factorise $8d - 6$

1, 8
2, 4

1, 6
2, 3

2(4d - 3)

**(1)**

**(Total for Question 13 is 4 marks)**

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**14** Last week, 73% of the tickets sold at a cinema were adult tickets.

(a) What percentage of the tickets sold were **not** adult tickets?

Adult 73

not adult 100 − 73 = 27

27 ..... %

**(1)**

Some people watched a film at the cinema.

number of adults : number of children = 2 : 5

(b) What fraction of these people were adults?

A : C

2 : 5

2 out of 7

$\frac{2}{7}$

$\frac{2}{7}$ .....

**(1)**

On Friday,

500 people watched a film at the cinema.
70% of these people were children.

On Saturday,

720 people watched the film at the cinema.
$\frac{5}{8}$ of these people were children.

Kasim thinks more children watched the film on Friday than on Saturday.

(c) Is Kasim correct?
You must show how you get your answer.

Friday = 500

70%

10% = 50

70% = 350

Saturday = 720

$\frac{5}{8}$

720 ÷ 8 = 90

90 × 5 = 450

Kasim is not correct

450 > 350

**(3)**

**(Total for Question 14 is 5 marks)**

**15** Work out $\frac{6}{7} \times \frac{5}{12}$

Give your answer as a fraction in its simplest form.

$\frac{\cancel{6}^{1}}{7} \times \frac{5}{\cancel{12}_{2}}$

$= \frac{5}{14}$

$\frac{5}{14}$

**(Total for Question 15 is 2 marks)**

**16** Here is the list of ingredients for making 20 biscuits.

| Ingredients for 20 biscuits |
|---|
| 150 g butter<br>100 g sugar<br>250 g flour |

Harry wants to make 60 biscuits.

How much flour does Harry need?

250g = 20 biscuits
750g = 60 biscuits
x3

750 g

**(Total for Question 16 is 2 marks)**

**17** There are 200 counters in a bag.

38 counters are red.
52 counters are blue.

The rest of the counters are yellow or green.
There are the same number of yellow counters as green counters.

What percentage of the counters in the bag are yellow?

LOOK ↑

R = 38

200
Blue = 52

4 4
the rest
= 110

38
+ 52
90

200 − 90
= 110

110 ÷ 2 = 55

% $\frac{55}{200_2} \times 100 = 27.5$

27.5 %

**(Total for Question 17 is 4 marks)**

**18** Naomi has $b$ bags of apples and $c$ crates of apples.

There are 5 apples in each bag.
There are 28 apples in each crate.

Naomi has a total of $T$ apples.

Write a formula for $T$ in terms of $b$ and $c$.

Bags
b
↑
5b

Crates
c
↑
28c

$T = 5b + 28c$

**(Total for Question 18 is 3 marks)**

**19** Here are the first five terms of an arithmetic sequence.

−13 −5 (+8) 3 (+8) 11 (+8) 19 (+8) 27

Find an expression, in terms of $n$, for the $n$th term of this sequence.

$8n - 13$

**(Total for Question 19 is 2 marks)**

**20** Work out $8.46 \div 0.15$

$\frac{8.46}{0.15} \times \frac{100}{100} = \frac{846}{15}$

$$15 \overline{)\,8^{8}4^{9}6.^{6}0} = 056.4$$

15
30
45
60
75 ←
90 ←
105
120
135
150

$56.4$

**(Total for Question 20 is 3 marks)**

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**21** Work out $7\frac{3}{8} - 2\frac{1}{2}$

Give your answer as a mixed number.

$7 \times 8 = 56$

$56 + 3 = 59$

$2 \times 2 = 4$

$4 + 1 = 5$

$\frac{59}{8} - \frac{5}{2}$ (×4)

$\frac{59}{8} - \frac{20}{8}$

$= \frac{39}{8}$

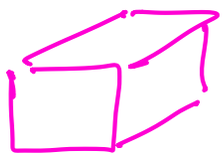
8
16
24
32
40

$4\frac{7}{8}$

**(Total for Question 21 is 3 marks)**

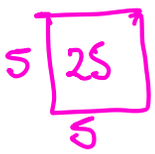
**22** A cube has a total surface area of $150\,cm^2$

Work out the volume of the cube.

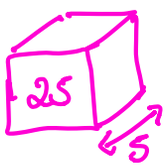


6 faces = $150cm^2$

so 1 face = $25cm^2$




so side length = 5cm




$25 \times 5 = 125$

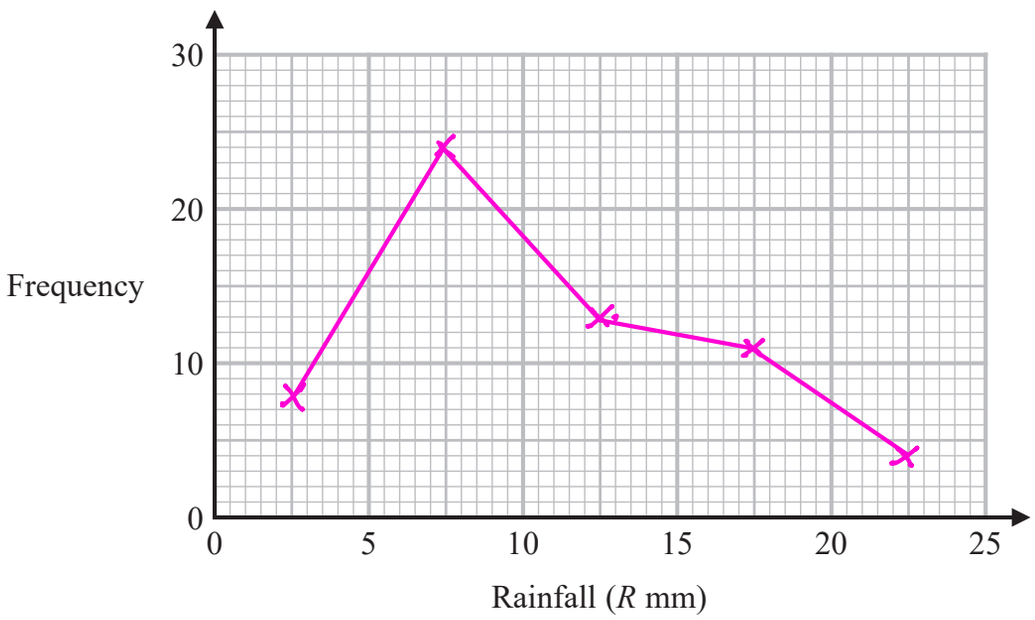
125 $cm^3$

**(Total for Question 22 is 4 marks)**

**23** The table shows information about the daily rainfall in a town for 60 days.

| Rainfall ($R$ mm) | Frequency |
|---|---|
| $0 \leqslant R < 5$ | 8 |
| $5 \leqslant R < 10$ | 24 |
| $10 \leqslant R < 15$ | 13 |
| $15 \leqslant R < 20$ | 11 |
| $20 \leqslant R < 25$ | 4 |

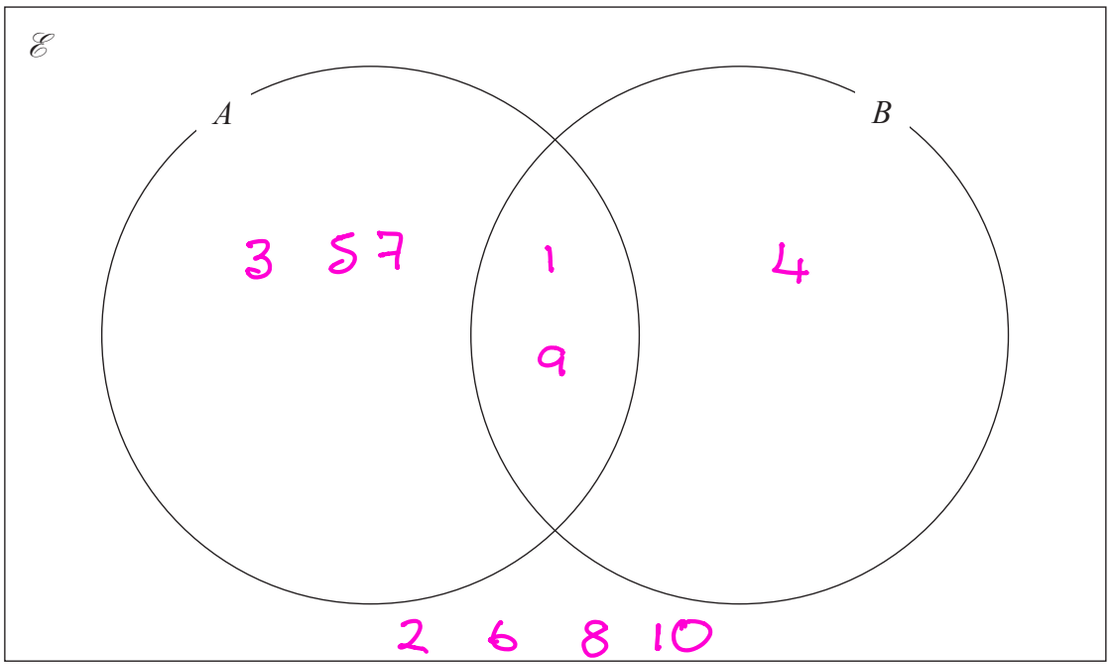
Draw a frequency polygon for this information.




**(Total for Question 23 is 2 marks)**

**24** $\mathscr{E}$ = {1, 2, 3, 4, 5, 6, 7, 8, 9, 10}
$A$ = {odd numbers} 1, 3, 5, 7, 9
$B$ = {square numbers} 1, 4, 9

(a) Complete the Venn diagram for this information.




**(3)**

A number is chosen at random from the universal set $\mathscr{E}$

(b) Find the probability that this number is in the set $B'$ NOT B

$\frac{7}{10}$

**(2)**

**(Total for Question 24 is 5 marks)**

**25** The scatter graph shows information about the ages and weights of some babies.


(a) Describe the relationship between the age and the weight of the babies.

There is a positive correlation.

(1)

Another baby has a weight of 5.8 kg

(b) Using the scatter graph, find an estimate for the age of this baby.

(This will depend on your line of best fit)

4 months

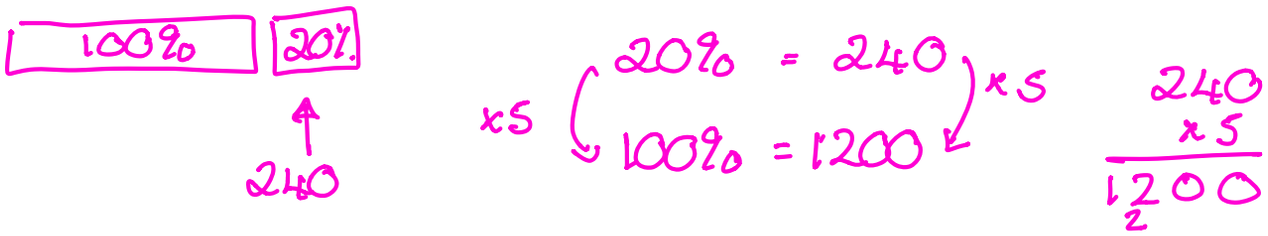
(range of 2.5 to 4.5 accepted)

(2)

**(Total for Question 25 is 3 marks)**

**26** The price of a holiday increases by 20%
This 20% increase adds £240 to the price of the holiday.

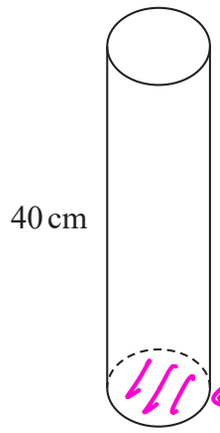
Work out the price of the holiday before the increase.




£ 1200

**(Total for Question 26 is 2 marks)**

**27** The diagram shows a solid cylinder on a horizontal floor.




$$\text{pressure} = \frac{\text{force}}{\text{area}}$$

Volume = cross sectional area × height

$1200 = \text{area} \times 40$

$\text{area} = \frac{1200}{40} = 30\text{cm}^2$

The cylinder has a

volume of $1200\,\text{cm}^3$
height of 40 cm.

The cylinder exerts a force of 90 newtons on the floor.

Work out the pressure on the floor due to the cylinder.

$P = ?$

force = 90 N

Area = $30\text{cm}^2$

$P = \frac{90}{30}$

3 newtons/$\text{cm}^2$

**(Total for Question 27 is 3 marks)**

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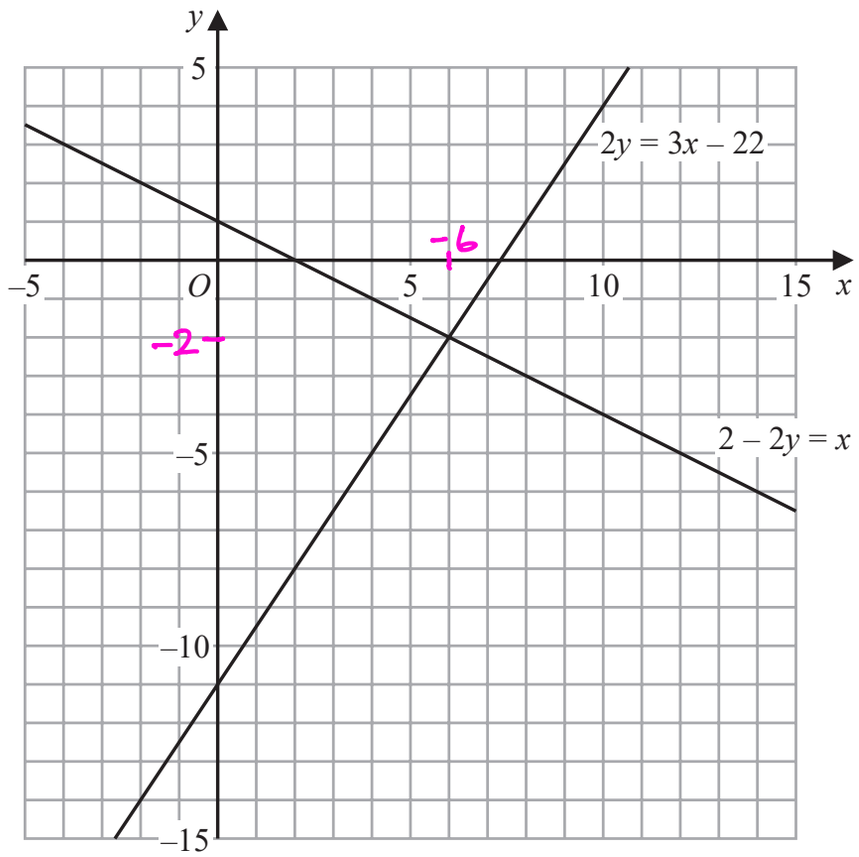
**28**




Use these graphs to solve the simultaneous equations

$$2 - 2y = x$$
$$2y = 3x - 22$$

$x =$ 6

$y =$ -2

**(Total for Question 28 is 1 mark)**

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**29** Work out the value of $\dfrac{4^{-6} \times 4^{9}}{4}$

$\dfrac{4^{-6+9}}{4^{1}} = \dfrac{4^{3}}{4^{1}}$

$= 4^{2}$

$4^{2} = 16$

16

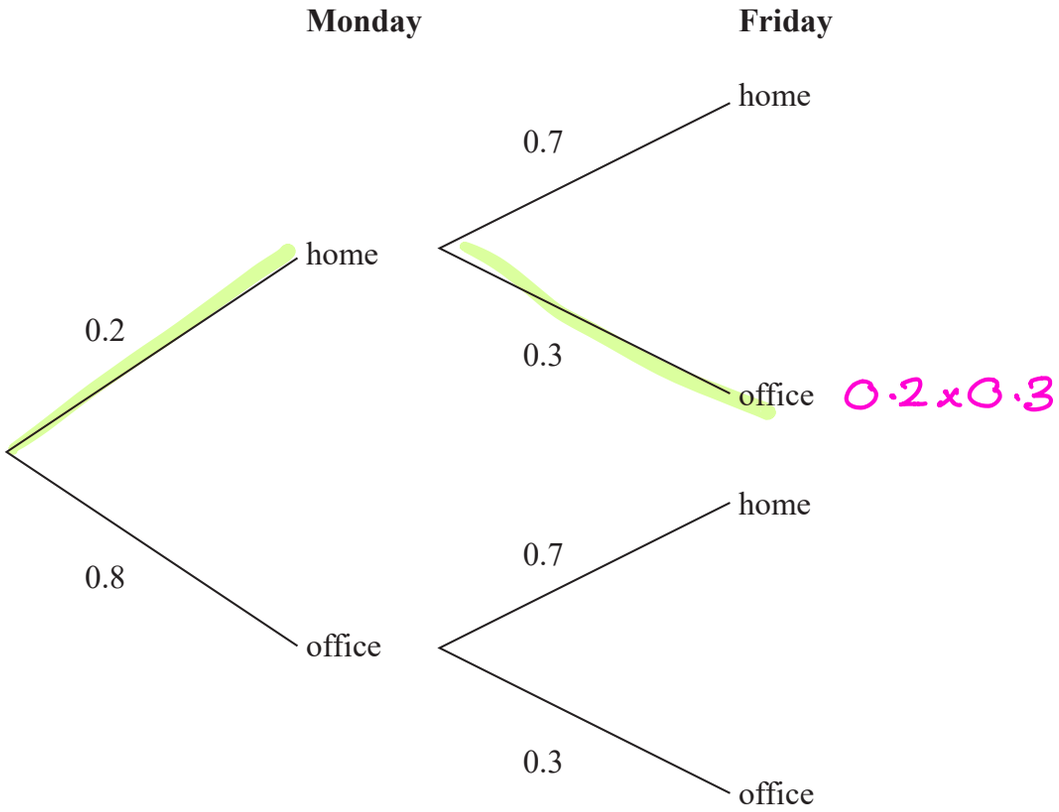
**(Total for Question 29 is 2 marks)**

**30** Write down the exact value of $\cos 60°$

$\frac{1}{2}$

**(Total for Question 30 is 1 mark)**

**31** The probability tree diagram shows the probabilities that Shayla will work at home or will work at the office on two days next week.




Work out the probability that Shayla will work at home on Monday and work at the office on Friday.

0·2 x 0·3 = 0·06

0·06

**(Total for Question 31 is 2 marks)**

**TOTAL FOR PAPER IS 80 MARKS**