Please check the examination details below before entering your candidate information

Candidate surname	Other names

Centre Number | Candidate Number

Pearson Edexcel Level 1/Level 2 GCSE (9–1)

Friday 19 May 2023

Morning (Time: 1 hour 30 minutes)

Paper reference **1MA1/1F**

Mathematics

PAPER 1 (Non-Calculator)

Foundation Tier

You must have: Ruler graduated in centimetres and millimetres, protractor, pair of compasses, pen, HB pencil, eraser, Formulae Sheet (enclosed). Tracing paper may be used.

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.*
- You must **show all your working**.
- Diagrams are **NOT** accurately drawn, unless otherwise indicated.
- **Calculators may not be used**.

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.
- Try to answer every question.
- Check your answers if you have time at the end.

Turn over ▶

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Pearson

Please note that these worked solutions have neither been provided nor approved by Pearson Education and may not necessarily constitute the only possible solutions. Please refer to the original mark schemes for full guidance.

Any writing in blue indicates what must be written in order to answer the questions and get the marks. The worked solutions have been designed to show the smallest amount of work which needs to be done to answer the question.

Anything written in green in a cloud doesn't have to be written in the exam.

Anything written in orange in a rectangle doesn't have to be written in the exam and is there to show what should be put into a calculator or measured using a ruler or protractor.

If you find any mistakes or have any requests or suggestions, please send an email to curtis@cgmaths.co.uk

.CG Maths.

Answer ALL questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

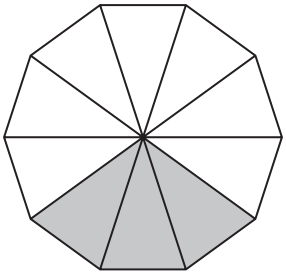
1 Write 38% as a decimal.

To convert percentage to a decimal it can be divided by 100. Moving the decimal point twice to the left does this

0.38

(Total for Question 1 is 1 mark)

2 What fraction of this shape is shaded?



3 out of the 10 equal sections are 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 has 0 units. All the other numbers have more than 0 units

0.5

(Total for Question 3 is 1 mark)

4 Work out $-9 + 5$

Counting on 5 from -9: -8, -7, -6, -5, -4

-4

(Total for Question 4 is 1 mark)

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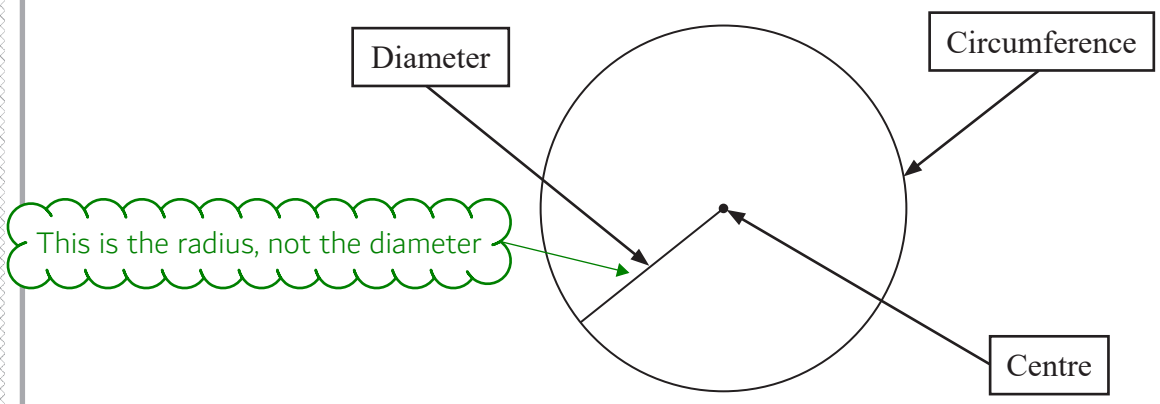
5 Solve $p - 2 = 3$

Adding 2 to both sides of the equation gets rid of the -2 on the left and gets p on its own. 3 + 2 = 5

$p =$ S

(Total for Question 5 is 1 mark)

6 Freddie adds labels to this diagram of a circle.



This is the radius, not the diameter

Explain why one of the labels is wrong.

The radius is labelled incorrectly

(Total for Question 6 is 1 mark)

Radius is a straight line going from the centre to the outside of the circle. Diameter is a straight line going from one part of the outside of the circle to another and goes through the centre

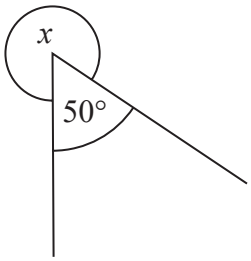
7 Write down **three** different factors of 20

The factors are the whole numbers which the 20 can be divided by. They can be thought of in pairs: 1 and 20, 2 and 10, 4 and 5

1 , 20 , 2

(Total for Question 7 is 2 marks)

8



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

360
- 50
310

There are 360° in total around a point. So subtracting the 50° from 360° leaves the angle x

310 °

(2)

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

The student is wrong.

(b) Explain why.

It is not more than 90°

Obtuse angles are greater than 90° and less than 180°

(1)

(Total for Question 8 is 3 marks)

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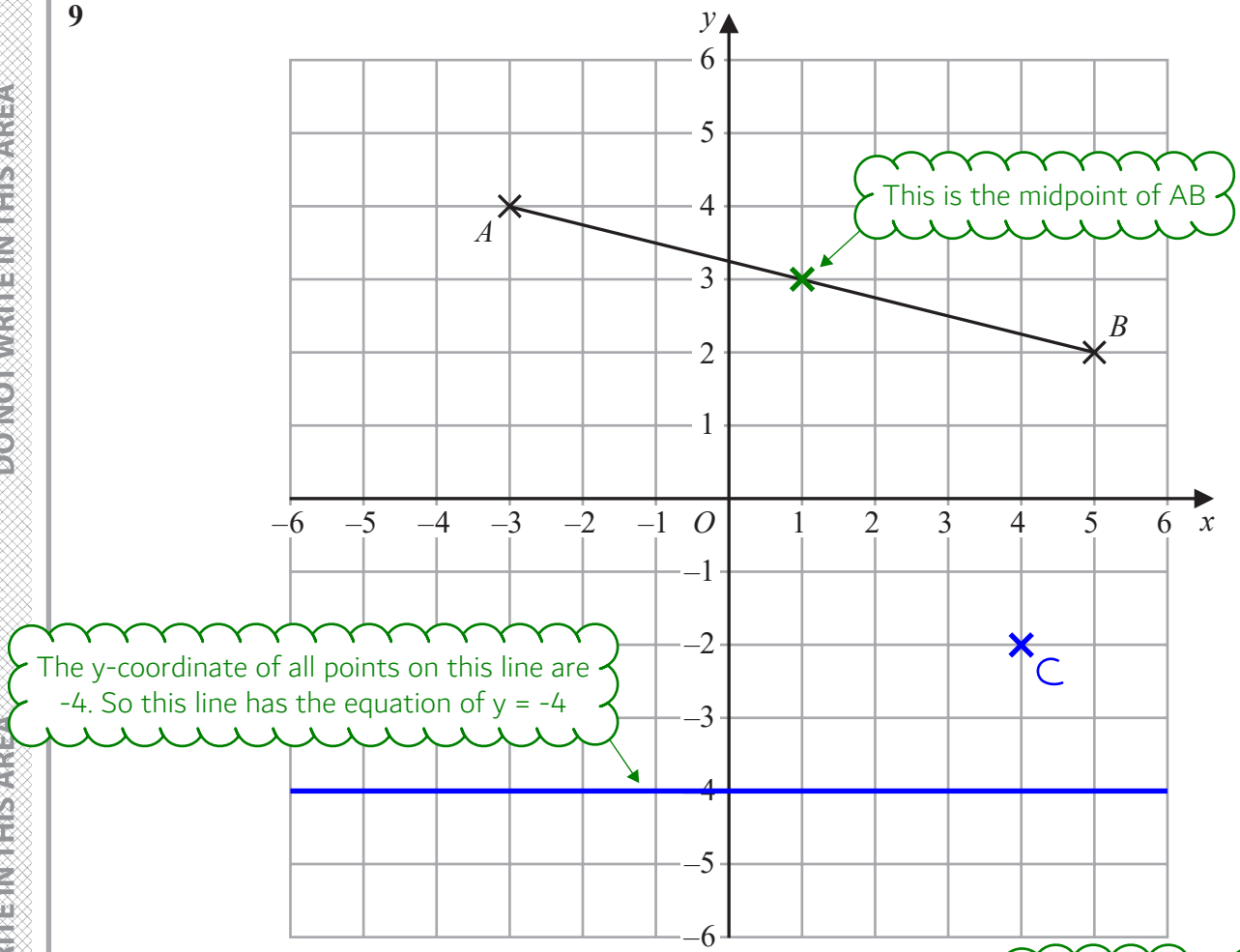
9



(a) Write down the coordinates of point B.

x-coordinate y-coordinate

(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.

The offer can be used 6 times. This gets 6 large plates at normal price and 6 small plates at half the normal price

$2 \times 6 = 12$ ← Multiplying the normal price of a large plate by 6 works out that the price of 6 large plates is £12

$2\overline{)0.80} = 0.40$ ← Dividing the normal price of a small plate by 2 works out that half the normal price of a small plate is £0.40. 80p is converted into £0.80 so that it is in pounds and is the same unit as used for the large plates

$0.40 \times 6 = 2.40$ ← Multiplying the £0.40 by 6 works out that the 6 small plates will cost £2.40

$+12.00$
14.40 ← Adding the £12 for the 6 large plates works out that the total cost of 6 large plates and 6 small plates is £14.40

Yes ← £14.40 is less than the £15 that Max has, so he does have enough money

(Total for Question 10 is 4 marks)

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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?

700
-452
248

Subtracting the 452 tickets which were sold from the 700 total tickets on sale leaves the number of tickets which were not sold

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.

300 × 10 = 3000
400 × 20 = 8000
11000

Rounding all the figures to 1 significant figure (which means to round to the first figure which is not a 0). 297 rounds to 300. £9.50 rounds to £10. 399 rounds to 400. £19.50 rounds to £20. Multiplying the rounded number of tickets by the rounded price works out the estimated money paid for each ticket price. Adding these together gives an estimate of the total amount of money paid for these tickets

£ 11000

(3)

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

Overestimate, as all of the values were rounded up

The amount of tickets and the price of each ticket is actually less than what we calculated with in (b) so the estimate will be more than the true cost

(1)

(Total for Question 11 is 6 marks)

12 Here are 6 numbers.

13 5 4 9 3 8

18 22 31 34 42 ÷ 6

Work out the mean.

Mean = total ÷ number, where total is all the numbers added together and number is how many numbers there are. So adding all the numbers up to get 42 then dividing by 6 as there are 6 numbers

7

(Total for Question 12 is 2 marks)

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

The 15 can be divided by the 3

5a

(1)

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

Collecting like terms, which are highlighted in the same colours.
5b - 7b = -2b
4c + c = 5c

19-2b+5c

(2)

(c) Factorise $8d - 6$

Bringing out 2 as the highest common factor of both terms, dividing both terms by this 2 and leaving the result in a bracket

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?

100
−73
27

Percentage is out of 100 so subtracting the 73% from 100% leaves the percentage which must be not adult tickets

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?

There are 7 parts in total in the ratio. Out of these, 2 parts were adults → $\frac{2}{7}$

(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.

500 ÷ 10 ← This works out that 10% of the 500 people on Friday is 50

50 × 7 = 350 ← Multiplying the 50 by 7 works out that 70% of the 500 people on Friday is 350

090 × 5 = 450
8 | 7'20 ← Dividing the 720 on Saturday by 8 works out 1/8, then multiplying this by 5 works out that 5/8 of the 720 people on Saturday is 450

No ← There were 350 on Friday, which is not more than the 450 on Saturday

(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.

$\frac{1}{7} \times \frac{5}{2}$ ← Dividing the 6 by 6 and the 12 by 6 simplifies the multiplication of the fractions. There are no other common factors between the numerators and denominators which both can be divided by

To multiply fractions, the numerators can be multiplied and the denominators can be multiplied → $\frac{5}{14}$

.....

(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
100 g sugar
250 g flour

Harry wants to make 60 biscuits.

How much flour does Harry need?

$60 \div 20$ ← This works out that the 60 is 3 lots of the 20. Therefore there will need to be 3 times each of the ingredients for 20 biscuits

$250 \times 3 = 750$ ← Multiplying the 250 g of flour by 3

750 ..... g

(Total for Question 16 is 2 marks)

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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?

38
+52
90

Adding the 38 red and 52 blue works out that 90 are red or blue

200
- 90
110

Subtracting the 90 which are red or blue from the 200 counters leaves 110 which must be yellow or green

055
2|110

Dividing the 110 which are yellow or green by 2 works out that 55 of the counters are yellow

27.5
2|55.0

The fraction is 55/200. Percentage is out of 100 so dividing both the numerator and denominator by 2 gives 27.5/100. So the percentage must be 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.

Multiplying the number of bags by the 5 apples in each bag expresses that there are 5b apples in the bags. Multiplying the number of crates by the 28 apples in each crate expresses that there are 28c apples in the crates. Adding the 5b apples in the bags and the 28c apples in the crates expresses that there are 5b + 28c apples in total. T must be equal to this

T=5b+28c

(Total for Question 18 is 3 marks)

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

–5 3 11 19 27

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

It increases by 8 between each term so must involve 8n. Going backward in the sequence finds that the 0th term (the one before the first term) is -13 so this is what is added to the 8n

8n-13

(Total for Question 19 is 2 marks)

20 Work out 8.46 ÷ 0.15

Both the 8.46 and 0.15 can be multiplied by 100 to get rid of the decimal in the 0.15. So 846 ÷ 15 is an equivalent division and gives the same answer

```
    0 5 6.4
15 | 8 4 6.0
30
45
60
75
90
```

56.4

(Total for Question 20 is 3 marks)

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

Give your answer as a mixed number.

$\frac{59}{8} - \frac{5}{2}$ ← Converting both mixed numbers into improper fractions by multiplying the whole numbers by the denominators and adding the result to the numerators

$\frac{59}{8} - \frac{20}{8}$ ← Multiplying both the numerator and denominator of 5/2 by 4 to get 20/8 so that the denominators of both fractions are the same

$\frac{39}{8}$ ← Subtracting the numerators and the denominator stays the same

Dividing the numerator by the denominator to get the whole number and leaving the remainder in the fraction →

$4\frac{7}{8}$

.....

(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.

$6\overline{)150}$ = 025 ← There are 6 equal square faces on a cube. So dividing the surface area by 6 works out that the area of one of the square faces is 25 cm^2

$25 \times 5 = 125$ ← Area of square = length^2, so square rooting the area of each square face works out that the length of the edges on the cube are 5 cm. Volume of cube = length^3 = 5 x 5 x 5 = 25 x 5

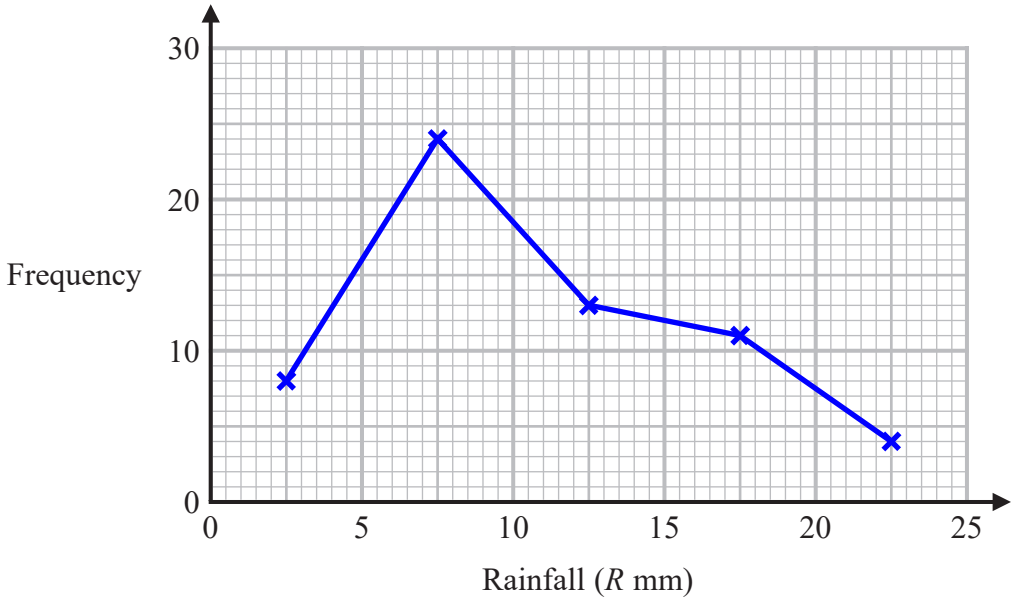
125 ..... cm^3

(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.

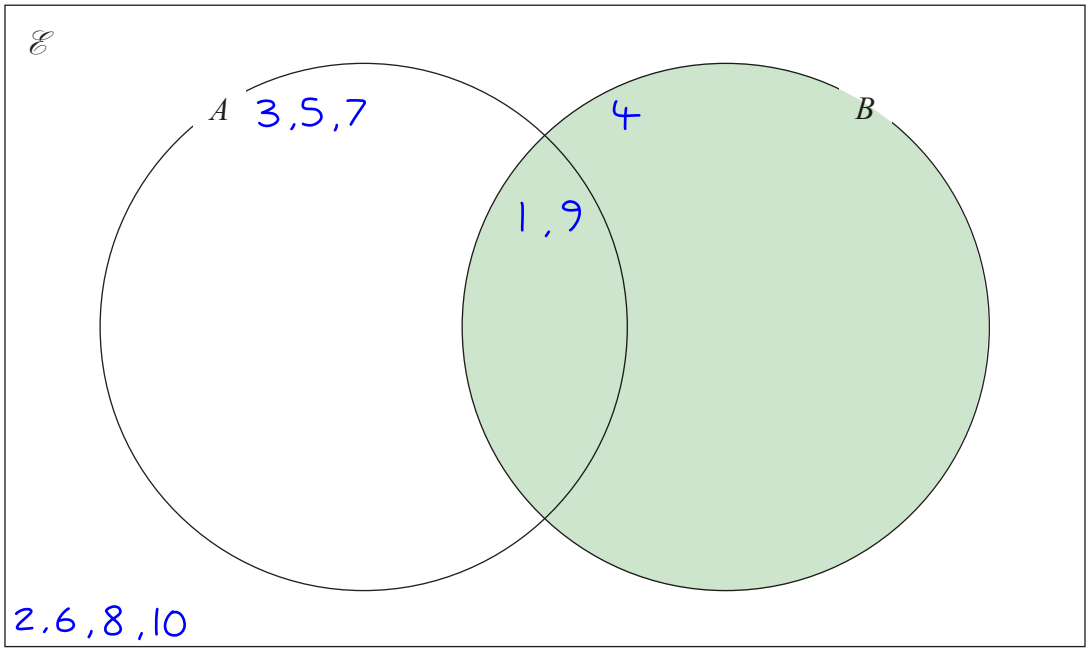


(Total for Question 23 is 2 marks)

Plotted the frequencies at the midpoints for each interval of rainfall then joined up the points with straight lines. The vertical scale goes up 10 over 10 small boxes. Dividing 10 by the 10 small boxes works out that each small box is worth 1

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

(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'

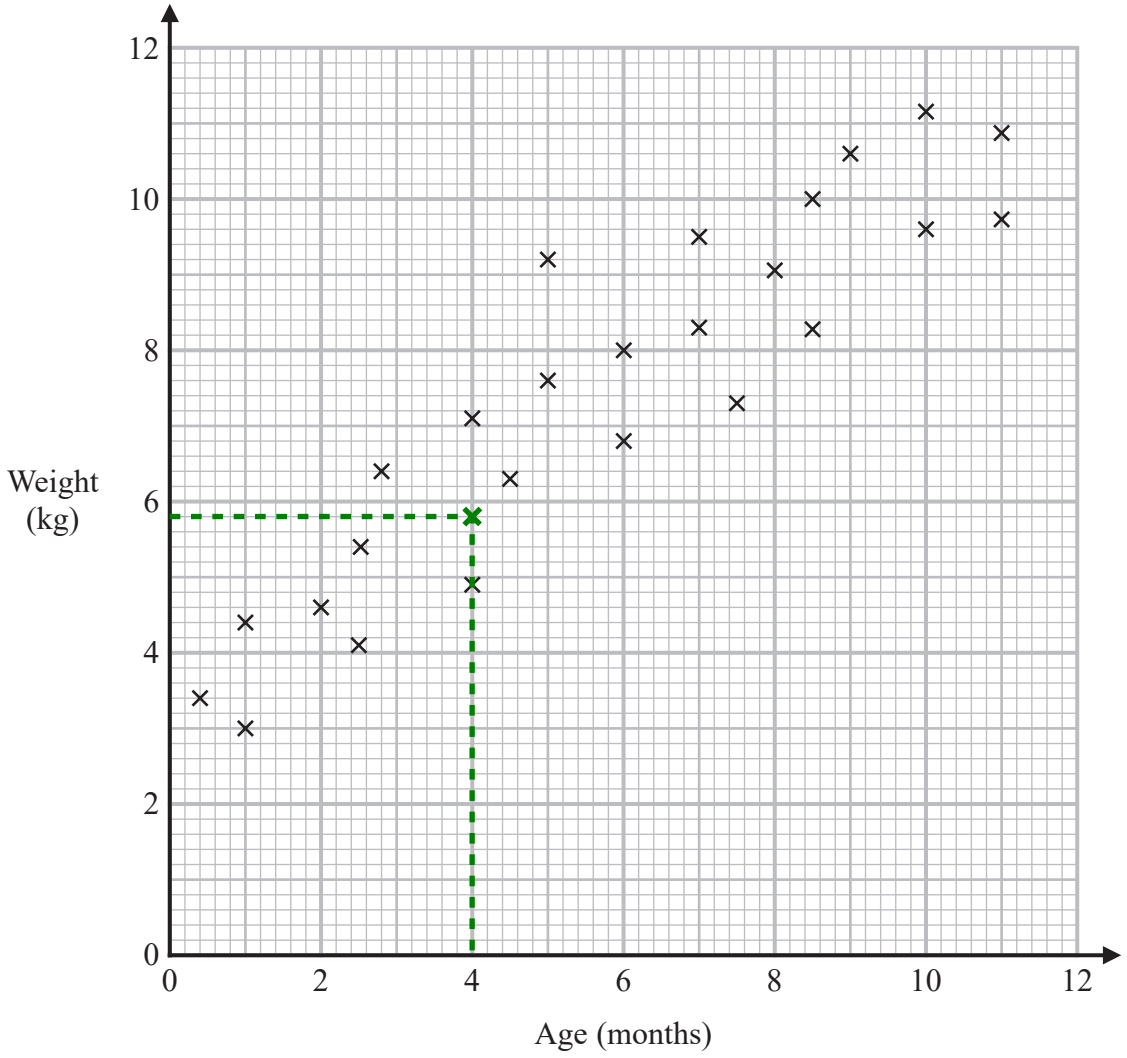
7 out of the 10 numbers are not in B. Everything not shaded in green is not in B

$\frac{7}{10}$

(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.

Positive correlation

As one variable goes up so does the other. The weight increases as the age increases

(1)

Another baby has a weight of 5.8 kg

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

The vertical scale goes up 2 over 10 small boxes. Dividing the 2 by the 10 small boxes works out that each small box is worth 0.2. So 5.8 is 1 box down from 6. Reading across from 5.8 on the vertical axis to a point which is roughly in the middle of the surrounding points then down to the horizontal axis

4 months

(2)

(Total for Question 25 is 3 marks)

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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.

$$20\overline{)240} = 12 \times 100$$

Dividing the £240 by the 20% which represents it works out that 1% of the price of the holiday is £12. Multiplying this by 100 works out the full 100% of the price of the holiday

£ 1200

(Total for Question 26 is 2 marks)

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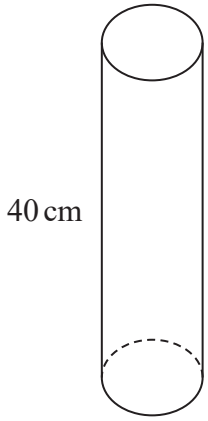
27 The diagram shows a solid cylinder on a horizontal floor.



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

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.

0030
40 | 1'2'00

Volume of cylinder = area of circle x height.
So area of circle = volume of cylinder ÷ height.
This works out that the area of the circle is 30 cm^2

90/30

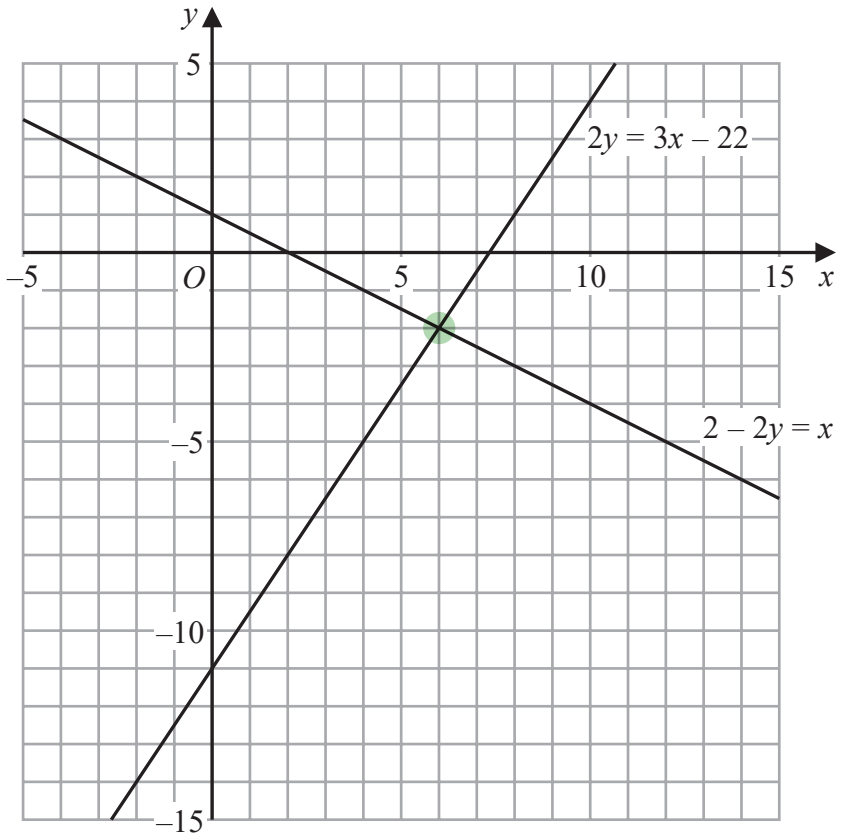
Putting the force over the area works out the pressure

90/30 = 9/3 = 3

3 ..... newtons/cm^2

(Total for Question 27 is 3 marks)

28



Use these graphs to solve the simultaneous equations

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

Simultaneous equations can be solved graphically by finding where they cross.
They cross at (6 , -2). The x-coordinate is 6 and the y-coordinate is -2

$x =$ 6

$y =$ -2

(Total for Question 28 is 1 mark)

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

$4^3 / 4^1$ ← $a^x \times a^y = a^{x+y}$, so the -6 and 9 should be added to give 3 as the power of 4 on the numerator. 4 is basically 4^1

4^2 ← $a^x / a^y = a^{x-y}$, so the 1 should be subtracted from the 3 to give 2 as the power of 4

$4^2 = 4 \times 4 = 16$

16

(Total for Question 29 is 2 marks)

30 Write down the exact value of cos 60°

0	30	45	60	90
4	3	2	1	0

$\frac{1}{2}$

(Total for Question 30 is 1 mark)

Writing the angles for the trig values we need to know. Writing 4, 3, 2, 1, 0 under these for the cos values. Square rooting the 1 which is under the 60 and putting it over 2 finds cos60

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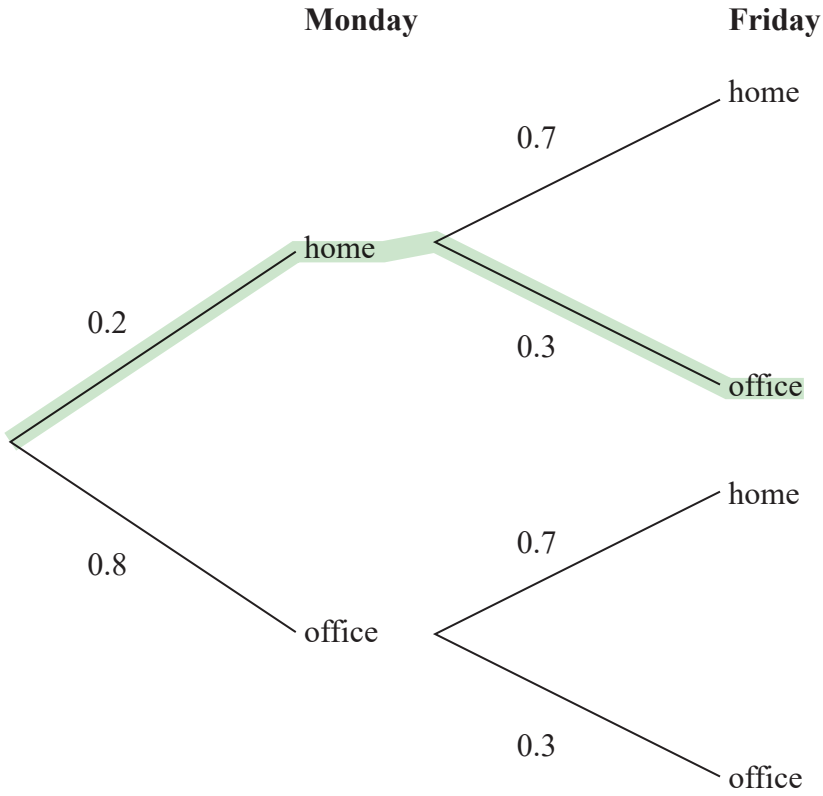
31 The probability tree diagram shows the probabilities that Shayla will work at home or will work at the office on two days next week.



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

0.2 × 0.3 ← 'And' means to multiply the probabilities

2 x 3 = 6. There are 2 decimal places in 0.2 x 0.3 so the decimal point should be moved 2 places to the left

0.06

(Total for Question 31 is 2 marks)

TOTAL FOR PAPER IS 80 MARKS