AQA

GCSE
Mathematics
Specification (8300/3F)
Paper 3 Foundation tier

F

Date | Morning | 1 hour 30 minutes

Materials

For this paper you must have:
- a calculator
- mathematical instruments.

JustMaths Solutions

Instructions
- Use black ink or black ball-point pen. Draw diagrams in pencil.
- Fill in the boxes at the bottom of this page.
- Answer **all** questions.
- You must answer the questions in the spaces provided. Do not write outside the box around each page or on blank pages.
- Do all rough work in this book.
- In all calculations, show clearly how you work out your answer.

Information
- The marks for questions are shown in brackets.
- The maximum mark for this paper is 80.
- You may ask for more answer paper, graph paper and tracing paper. These must be tagged securely to this answer book.

Please write clearly, in block capitals, to allow character computer recognition.

Centre number ⬜⬜⬜⬜ Candidate number ⬜⬜⬜⬜

Surname

Forename(s)

Candidate signature

8300/3F

Answer **all** questions in the spaces provided.

1   Here are seven numbers.

13   6   12   7   6   4   8

1 (a)   Work out the range of the seven numbers.
Circle your answer.

[1 mark]
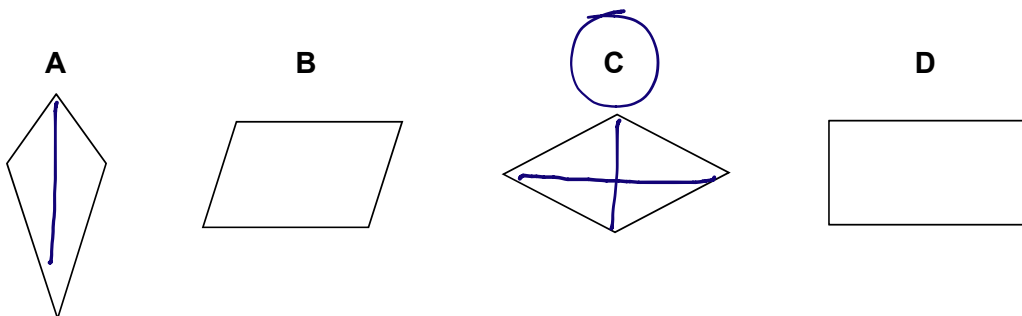
5   6   7   8   ⑨

1 (b)   What is the mode of the seven numbers?
Circle your answer.

[1 mark]

5   ⑥   7   8   9

2 Which shape has **two** lines of symmetry **and** its diagonals intersecting at 90˚?

Circle the correct letter.

[1 mark]

A B C D

3 Which of these is a cube number?

Circle your answer.

[1 mark]

3   9   27   100

Turn over for the next question

4   Liz buys a car for £7500

   She pays a deposit of £1875

   She pays the rest in 36 equal monthly payments.

Work out the amount of each monthly payment.

[3 marks]

$$7500 - 1875 = 5625 \div 36$$

Answer £ _____ 156·25 _____

5   120 men and 80 women were asked if they drive to work.

   Altogether $\frac{1}{4}$ of the people said yes.
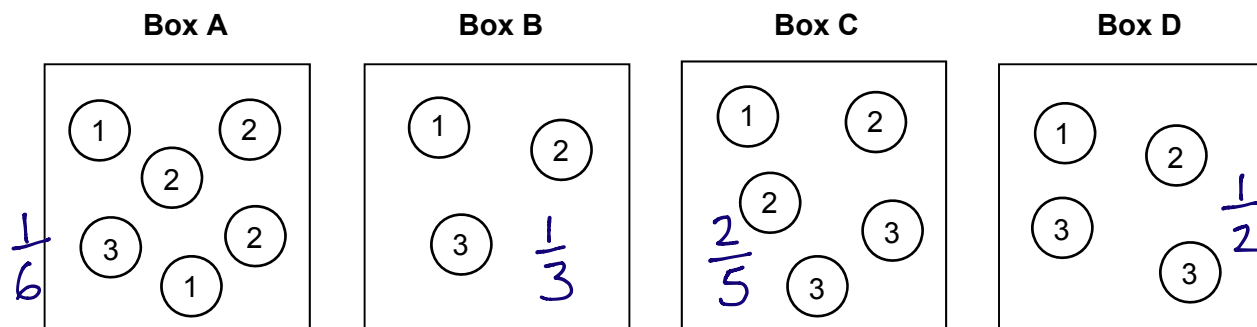
   $\frac{1}{3}$ of the men said yes.

What fraction of the women said yes?

[4 marks]

m   w

¼

Total   120   80 | 200   ¼ of total = 50

⅓ of men   50 - 40 = 10

= 40   women

Answer _____ $\frac{10}{80} = \frac{1}{8}$ _____

6 Boxes A, B, C and D contain balls with numbers on them.

| Box A | Box B | Box C | Box D |

Box A: ① ② ② ③ ② ① $\frac{1}{6}$

Box B: ① ② ③ $\frac{1}{3}$

Box C: ① ② ② ③ ③ $\frac{2}{5}$

Box D: ① ② ③ ③ $\frac{1}{2}$

A ball is picked at random from each box.

6 (a) Which box gives the **greatest** chance of picking a 3?

You **must** show your working.

[2 marks]

$\frac{1}{6} = 0.1\dot{6}$

$\frac{1}{3} = 0.\dot{3}$
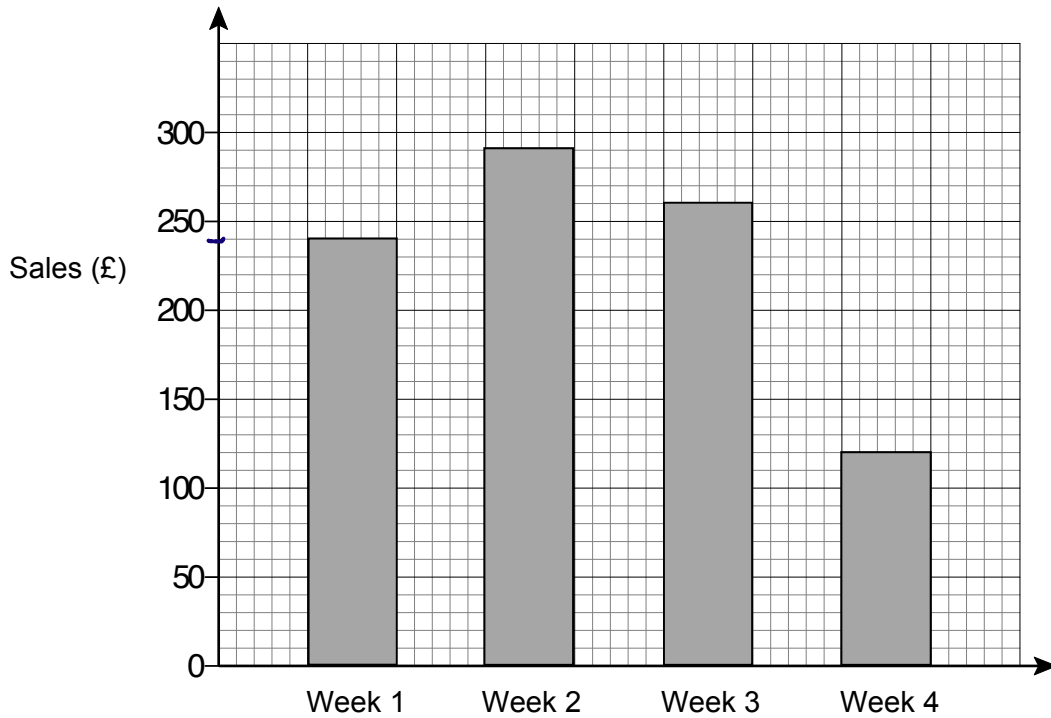
$\frac{2}{5} = 0.4$

$\frac{1}{2} = 0.5$

Box ___D___

6 (b) Which two boxes give the **same** chance of picking a 1?

[1 mark]

$\frac{2}{6}$ $\frac{1}{3}$ $\frac{1}{5}$ $\frac{1}{4}$

Box ___A___ and Box ___B___

7   Zayn records his weekly sales.

Every week his costs are £87.50

7 (a)   Work out his profit in Week 1

[2 marks]

240 - 87·50

Answer £   152·50

7 (b)   His sales in Week 4 were half of his sales in Week 1

Zayn says,

"This means that my profit in Week 4 was half of my profit in Week 1"

Is he correct?

You **must** show your working.

[2 marks]

sales in week 1 = 240   Profit = 152·50
Sales in week 4 = 120 - 87·50 = 32·50

no his profit was alot less than a half of the profit in week 1

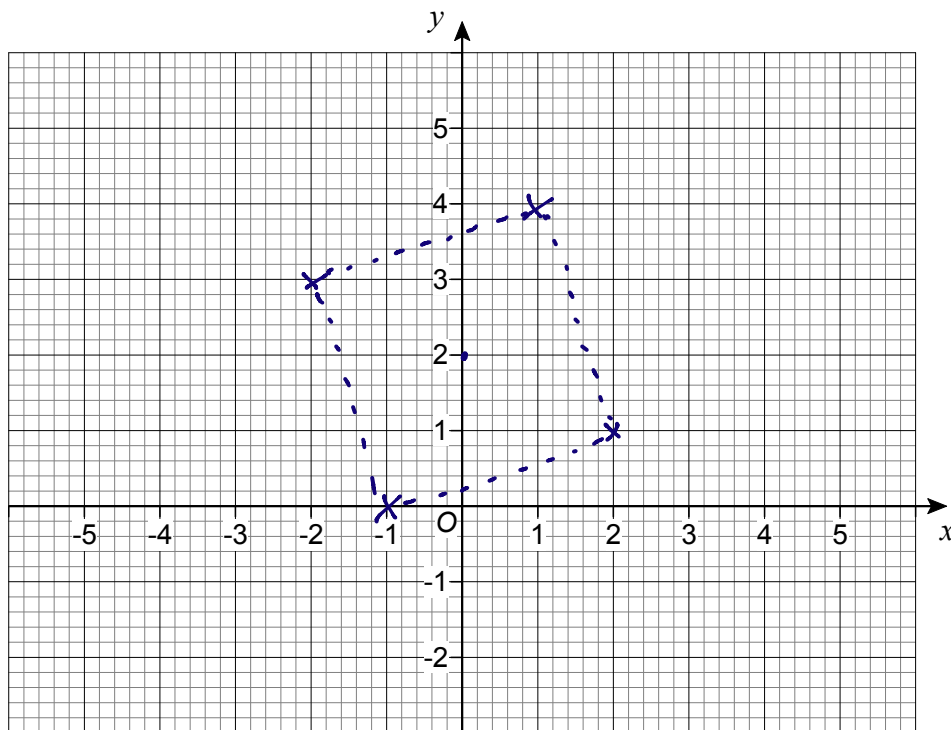**8** Work out the value of $5x + 9y$ when $x = 7$ and $y = -2$

[2 marks]

$5 \times 7 + 9 \times -2$

$35 - 18$

Answer _____ 17 _____

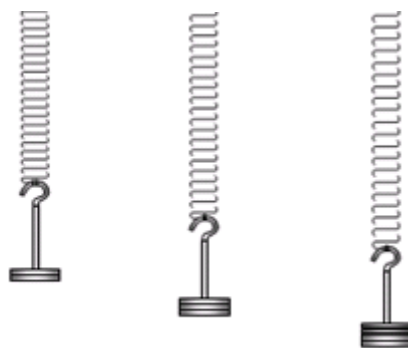**9** The points $(-1, 0)$ and $(1, 4)$ are the diagonally opposite corners of a square.

Work out the coordinates of the other **two** corners of the square.

[2 marks]

Answer (__2__ , __1__) and (__-2__ , __3__)

10   In an experiment, different masses are hung on a spring.

The length of the spring is measured for each mass.

Mass (g)	10	20	30	40
Length (cm)	20.8	21.6	22.4	23.2

10 (a)   Draw a graph to show the length of the spring for masses from 10 g to 40 g

[2 marks]

Length (cm)

Mass (g)
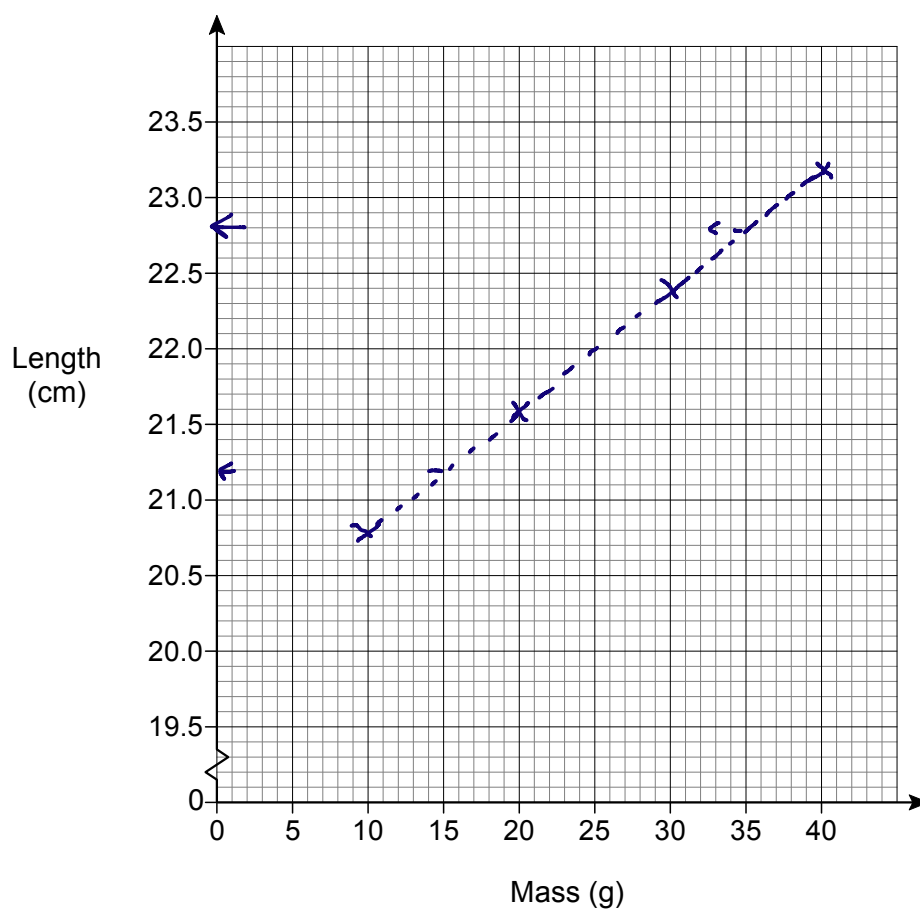
10 (b) Estimate the length of the spring with no mass hung on it.

[1 mark]

Answer _____ 20 _____ cm

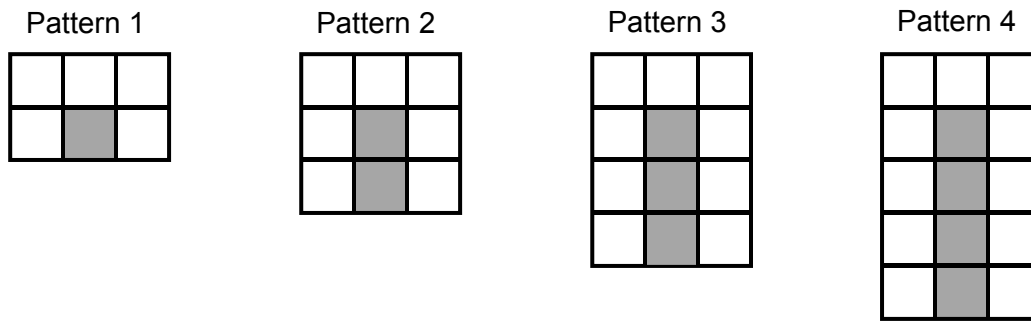**10 (c)** How much longer is the spring with a 35 g mass than with a 15 g mass?

[2 marks]

35cm = 22.8

15cm = 21.2

Answer _____ 1.6 _____ cm

Turn over for the next question

11 A sequence of patterns uses grey squares and white squares.

Here are the first four patterns.

Pattern 1   Pattern 2   Pattern 3   Pattern 4

11 (a) Work out the **total** number of squares in Pattern 100

[3 marks]

$n = 1$ 2   3   4 .... n
w 5   7   9   11 $2n+3$
B 1   2   3   4 n
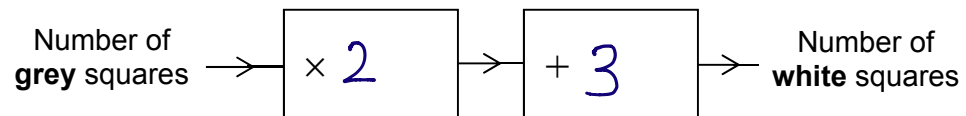Total 6   9   12   15 $3n+3$

$+3$ $+3$

100th pattern $= 3 \times 100 + 3$

$= 303$

Answer _____303_____

11 (b) Complete this number machine for the sequence of patterns.

[1 mark]

Number of
grey squares $\rightarrow$ $\boxed{\times\ 2}$ $\rightarrow$ $\boxed{+\ 3}$ $\rightarrow$ Number of
white squares

Turn over for the next question

12   In Scotland, squirrels are red or grey in the ratio   red : grey $= 1 : 2\frac{1}{2}$

12 (a)   What fraction of the squirrels in Scotland are red?

[2 marks]

$$\frac{1}{3.5} : \frac{2}{7}$$

Answer $\frac{2}{7}$

12 (b)   In Scotland there are 120 000 red squirrels.

How many squirrels are there altogether in Scotland?

[2 marks]

R   G 120000×2.5

120,000   300,000

$\boxed{+}$

Answer   420,000

13 Hayley and Tom have £2000 to spend on food at their wedding.

Here are their two options.

Wonderful Weddings!

Normal price   £32 per person

Special offer

10% off

Kim the Caterer

Number of people	Price per person
100 & over	£24.50
80 to 99	£26.50
60 to 79	£28.50
up to 59	£30.50

Work out the **maximum** number of people they can pay for.

Show working to compare the maximum number of people for **both** options.

[5 marks]

W.W   10% = £3.20   ⟹ £28.80 per person   £2000 ÷ 28.80

= 69.4 people

= 69

Kim. 2000 ÷ 28.50 = 70.1 people.

= 70

The most they can invite is 70

Answer   70

14 Solve $4(x + 5) = 15$

[3 marks]

$$4x + 20 = 15$$
$$-20 \quad -20$$
$$4x = -5$$
$$x = -5/4$$

$x =$ -1.25

15 The mass of 40 cm^3 of copper is 356 grams.

Work out the mass of 90 cm^3 of copper.

[2 marks]

$\div 4 \left(\begin{array}{l} 40 \text{ cm}^3 = 356 \text{ grams} \\ 10 \text{ cm}^3 = 89 \text{ g} \end{array}\right) \div 4$

$\times 9 \left(\begin{array}{l} 90 \text{ cm}^3 = 801 \text{ g} \end{array}\right) \times 9$

Answer _____801_____ grams

16   24 boys, 45 girls and 281 adults are the members of a badminton club.

50 more children join the club.

The number of girls is **now** 18% of the total number of members.

How many of the 50 children were **boys**?

[4 marks]

B   G   A

24   45   281

69 + 50

119   new total = 400

18% of 400 = 400 × 0.18 = 72   72 − 45 = 27 ← Girls

so 23 boys

Answer   23

Turn over for the next question

17 The table shows information about the marks of 30 students in a test.

Mark	Frequency	
14	2	28
15	10	150
16	2	32
17	3	51
18	13	234
Total = 30		495

Students who scored less than the mean mark have to retake the test.

How many students have to retake the test?

You **must** show your working.

[3 marks]

$495 \div 30 = 16.5$ mean score = 16.5

retakes = 2 + 10 + 2

Answer   14

18 Work out the square root of 100 million.

Circle your answer.

100,000,000

[1 mark]

1000   10 000   100 000   1 000 000

19 $\mathbf{a} = \begin{pmatrix} 5 \\ -2 \end{pmatrix}$ and $\mathbf{b} = \begin{pmatrix} -2 \\ 3 \end{pmatrix}$

$\begin{pmatrix} 5 \cdot -2 \\ -2 - 3 \end{pmatrix}$ $\begin{matrix} 7 \\ -5 \end{matrix}$

Circle the vector $\mathbf{a} - \mathbf{b}$

[1 mark]

$\begin{pmatrix} -3 \\ -5 \end{pmatrix}$ $\begin{pmatrix} 7 \\ 1 \end{pmatrix}$ $\begin{pmatrix} 3 \\ 1 \end{pmatrix}$ $\begin{pmatrix} 7 \\ -5 \end{pmatrix}$

20 Circle the decimal that is closest in value to $\dfrac{2}{3}$

[1 mark]

0.6   0.66   0.667   0.67

Turn over for the next question

21 When $x^2 = 16$ the **only** value that x can be is 4

Is this true or false?

Tick a box.

[1 mark]

True ☐   False ☑

Reason *it can also be − 4*

22 In 1999 the minimum wage for adults was £3.60 per hour.

In 2013 it was £6.31 per hour.

Work out the percentage increase in the minimum wage.

[3 marks]

$6.31 - 3.60 = 2.71$ $\dfrac{2.71}{3.60} \times 100$
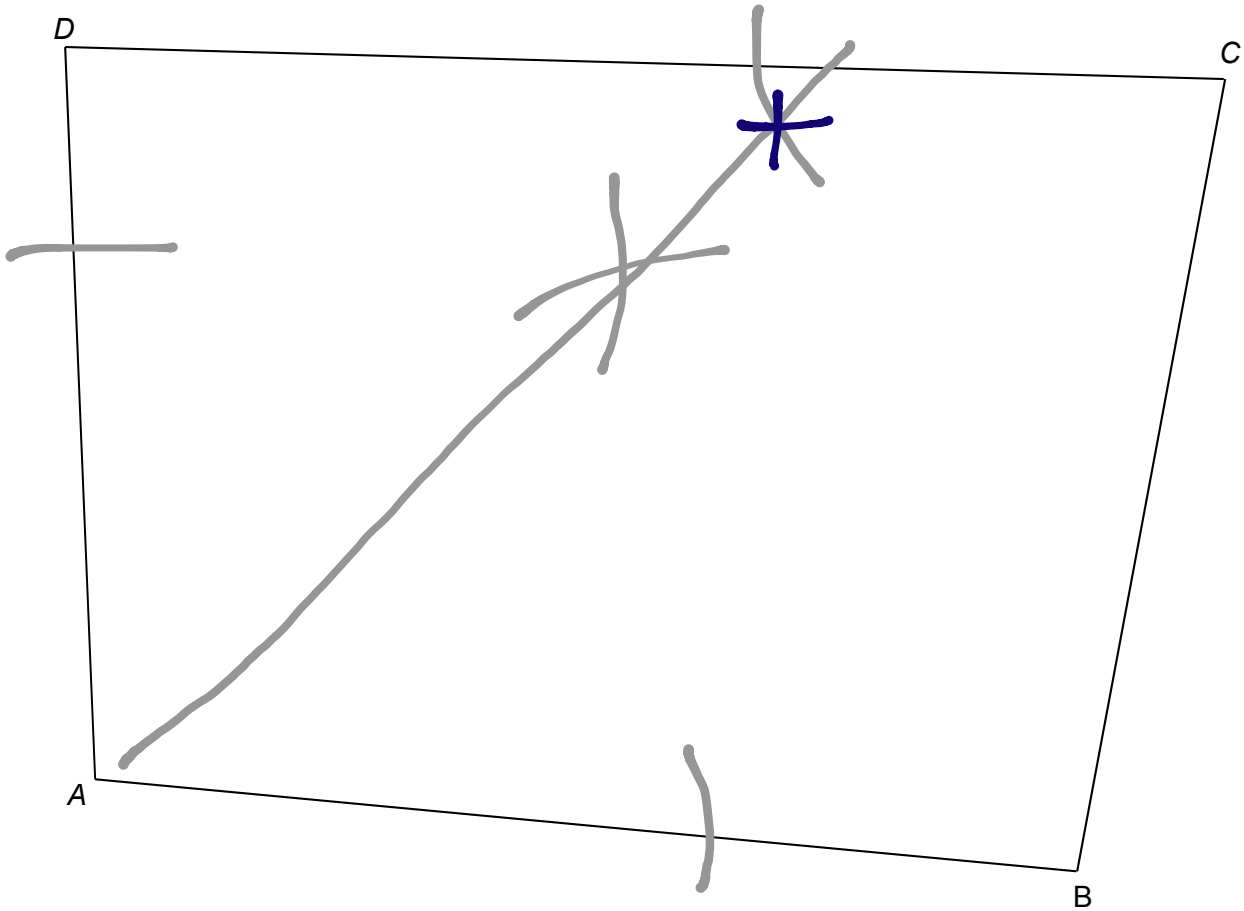
Answer *75.27 or 75.3* %
(1dp)

23   Use ruler and compasses to answer this question.   *Yours will be more accurate... mine isnt drawn to scale*

Point *P* is

- the same distance from *AB* and *AD*
- 6 cm from *C*.

Show the position of *P* on the diagram.

[3 marks]

Turn over for the next question

24 (a)   Use your calculator to work out $19.42^2 - \sqrt[3]{1006} \div 4.95$

Write down your full calculator display.

[1 mark]

$$377 \cdot 1364 - \underbrace{10 \cdot 01996013 \div 4 \cdot 95}_{2 \cdot 02423437}$$

Answer $375 \cdot 1121656$

24 (b)   Use approximations to check that your answer to part (a) is sensible.

You **must** show your working.

[2 marks]

$19.42^2 \simeq 20^2 = 400$ $400 - \underbrace{10 \div 5}_{2}$

$\sqrt[3]{1006} \simeq \sqrt[3]{1000} = 10$

$4.9 \simeq 5$ 398

25 Three cups, A, B and C, contain only salt and water.

The different mixtures are

      A   salt : water $= 3 : 22$ $\frac{3}{25} = 0.12$

      B   salt $= \frac{1}{8}$ 12.5%

    (**C**)   salt $= 12.75\%$

Which cup has the greatest proportion of salt?

You **must** show your working.

[3 marks]

$A = 0.12 = 12\%$

$B = 12.5\%$

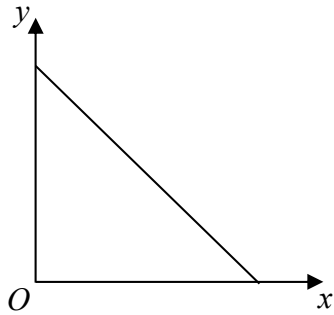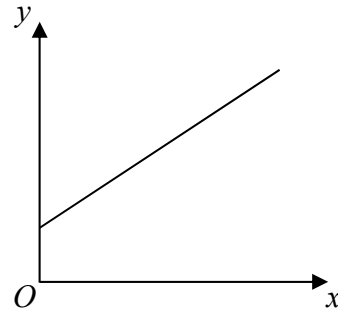$C = 12.75\%$
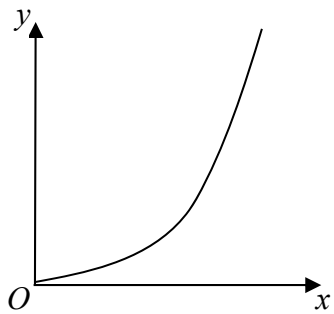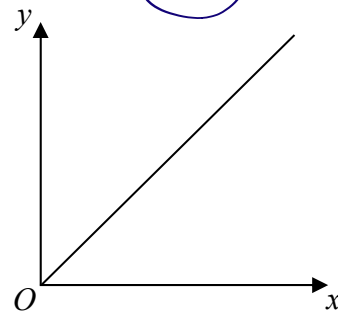
Answer _____

Turn over for the next question

26 *y* is directly proportional to *x*.

Which graph shows this?

Circle the correct letter.

[1 mark]

A

B

C

D

27   A bag contains counters that are red, blue, green or yellow.

	red	blue	green	yellow
Number of counters	9	$3x$	$x-5$	$2x$

48   16-5   32
          11

A counter is chosen at random.

The probability it is **red** is $\dfrac{9}{100}$

Work out the probability it is green.

[4 marks]

$3x + x - 5 + 2x = 91$

$\qquad 6x = 96$

$\qquad x = 96/6$

$\qquad x = 16$

Answer $\dfrac{11}{100}$

Turn over for the next question

28 The pressure at sea level is 101 325 Pascals.

Any rise of 1 km above sea level decreases the pressure by 14%

For example,

at 3 km above sea level the pressure is 14% less than at 2 km

Work out the pressure at 4 km above sea level.
Give your answer to 2 significant figures.

[4 marks]

0km, 101 325 Pascals

−14% 1km × 0.86 = 87139.5

−14% 2km × 0.86 = 74939.97

−14% 3km × 0.86 = 64448.3742

−14% 4km × 0.86 = 55425.60181

Answer ___55,000___ Pascals

29   *ABC* is a triangle with *AB* = *AC*

BA is parallel to CD.

Not drawn
accurately

A

x

D

P

$90-x$

$60°$

$90-x$

15°

75

x

B

C
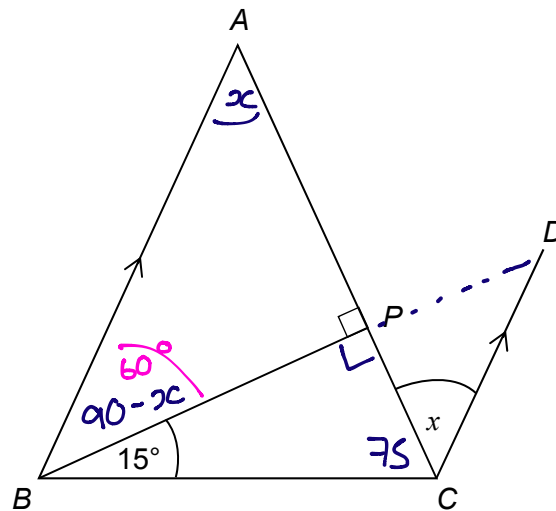
Show that angle x = 30°

[3 marks]

$B\hat{P}C = 90$

$B\hat{C}P = 180 - (90+15) = 75$

$A\hat{P}B = 180 - (15+75+x) = 90-x$

$A\hat{B}C = P\hat{C}B = 75°$

$75-15 = 60°$

$180 - (90+60)$

$180 - 150 = 30°$

END OF QUESTIONS

There are no questions printed on this page

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