OXFORD

INTERNATIONAL
AQA EXAMINATIONS

Please write clearly, in block capitals.

Centre number | | | | | | Candidate number | | | | |

Surname _____

Forename(s) _____

Candidate signature _____

OXFORD AQA INTERNATIONAL GCSE

MATHEMATICS EXTENSION

PAPER 2E (9260/2E)

Specimen 2018 Morning Time allowed: 2 hours

Materials

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

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 space provided. Do not write outside the box around each page or on blank pages.
- Do all rough work in this book. Cross through any work that you do not want to be marked.
- In all calculations, show clearly how you work out your answer.

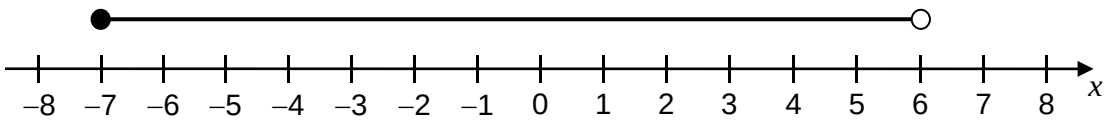
Information

- The marks for questions are shown in brackets.
- The maximum mark for this paper is 100
- You may ask for more answer paper, graph paper and tracing paper. These must be tagged securely to this answer booklet.

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

1 Circle the inequality shown by the diagram.

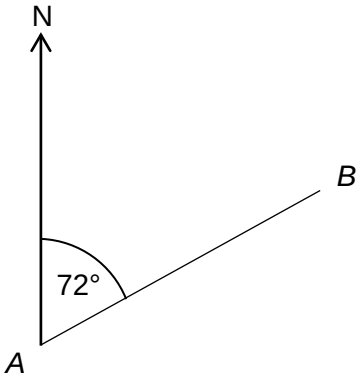
[1 mark]



$-7 < x < 6$ $-7 \leqslant x < 6$ $-7 < x \leqslant 6$ $-7 \leqslant x \leqslant 6$

2 The bearing of *B* from *A* is 072°

Not drawn accurately



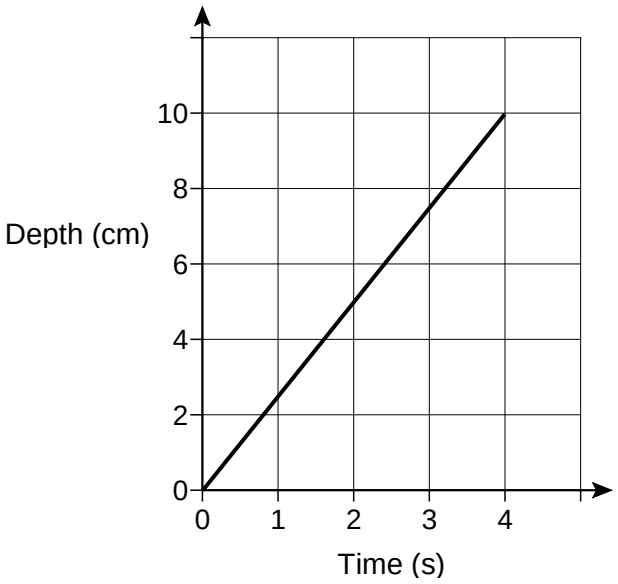
Circle the bearing of *A* from *B*.

[1 mark]

108° 172° 252° 288°

3 Water is poured into a glass for 4 seconds.

The graph shows the depth of the water in the glass.



What is the rate of change of the depth of the water?

Circle your answer.

[1 mark]

0.4 cm/s 1.25 cm/s 2.5 cm/s 10 cm/s

4 The probability that a biased coin lands on heads is $\frac{2}{3}$

The coin is spun twice.

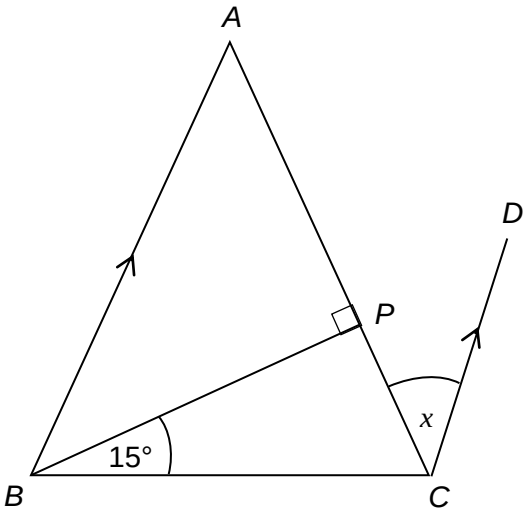
Circle the probability of two heads.

[1 mark]

$\frac{2}{9}$ $\frac{4}{6}$ $\frac{4}{9}$ $\frac{4}{3}$

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

BA is parallel to *CD*.



Not drawn accurately

Show that angle $x = 30°$

[3 marks]

6 Some people are at a concert.

$\frac{3}{5}$ are women.

$\frac{1}{6}$ are men.

The rest are children.

There are 56 children.

How many **men** are at the concert?

[4 marks]

Answer _____

7 A box contains some cards.

Each card has a question.
Each question is about **History**, **Languages**, **Movies** or **Sport**.
The questions have three levels **Easy**, **Medium** or **Difficult**.

A card is picked at random.
The table shows the probability that each type of question is picked.

	Easy	**Medium**	**Difficult**
History	0.15	0.20	0.05
Languages	0.10	0.08	0.02
Movies	0.01	0.03	0.06
Sport	0.12	0.07	0.11

7 (a) What is the probability that it is a **Sport** question?

[1 mark]

Answer _____

7 (b) What is the probability that it is a **Medium** level question about **Languages** or **Movies**?

[1 mark]

Answer _____

7 (c) There are 200 cards in the box altogether.

How many **Easy** questions are about **History**?

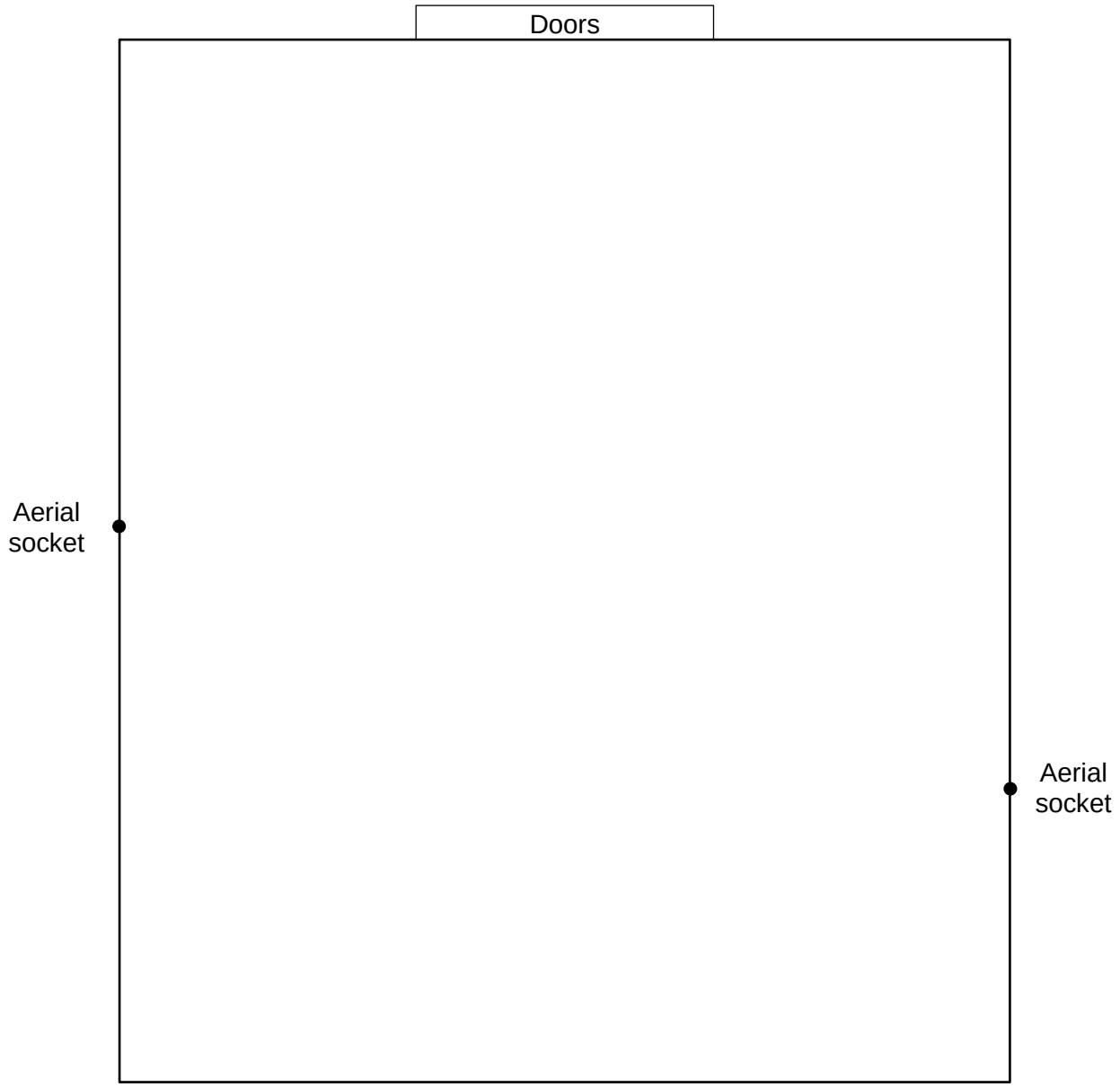
[2 marks]

_____

Answer _____

8 The diagram shows the plan of a room.

Scale: 4 cm represents 1 m



A new socket is to be fitted to **one of the walls**.

It must be

- equidistant from the two aerial sockets
- at least half a metre from the doors.

Use a ruler and compasses to show where the socket should be fitted.

Mark the position with a letter S.

[4 marks]

9 In a school, 60% of the students are girls.

50% of the girls walk to school.

20% of the boys walk to school.

What percentage of the students walk to school?

[3 marks]

Answer _____ %

10 Here is some information about the number of books read by a group of people in 2014

Number of books	Frequency	Midpoint	
0 – 4	16	2	
5 – 9	x	7	
10 – 14	20	12	
15 – 19	10	17	

Midpoints are used to work out an estimate for the mean number of books read.
The answer is 8.5

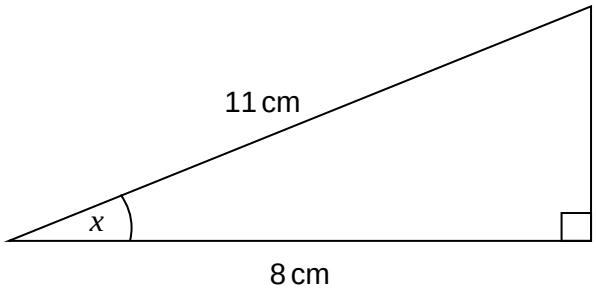
Work out x.

[4 marks]

Answer _____

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

Not drawn accurately

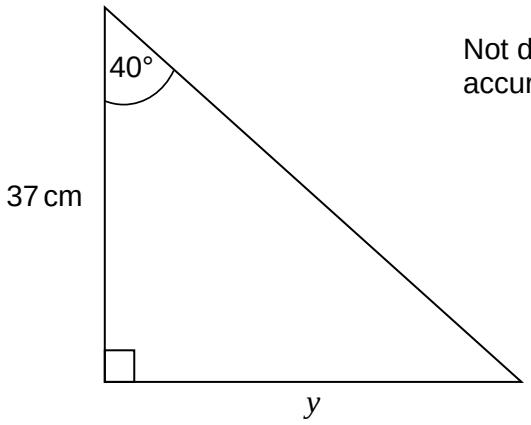


[2 marks]

Answer _____ degrees

11 (b) Work out length y.

Not drawn accurately



[2 marks]

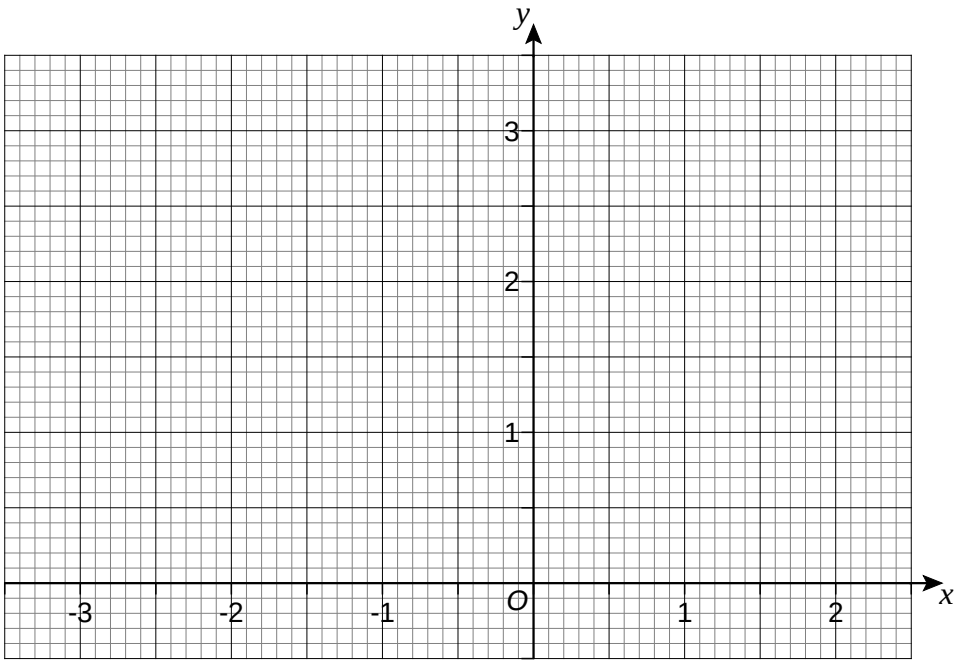
Answer _____ cm

12 A function $f(x)$ is defined as

$$f(x) = \begin{cases} x + 3 & -3 \leqslant x < 0 \\ 3 & 0 \leqslant x < 1 \\ 5 - 2x & 1 \leqslant x < 2 \end{cases}$$

Draw the graph of $y = f(x)$ for $-3 \leqslant x \leqslant 2$

[3 marks]



13 $y = \dfrac{5\sqrt{x}}{2}$

Circle the expression for y^2

[1 mark]

$\dfrac{25x}{4}$ $\dfrac{5x}{2}$ $\dfrac{5x^2}{2}$ $\dfrac{25x^2}{4}$

14 At a school

number of boys : number of girls = 9 : 7

There are 116 **more** boys than girls.

Work out the total number of students at the school.

[3 marks]

Answer _____

15 $1800 is invested at 4% compound interest per year.

After how many years is the investment first worth over $2000?
You **must** show your working.

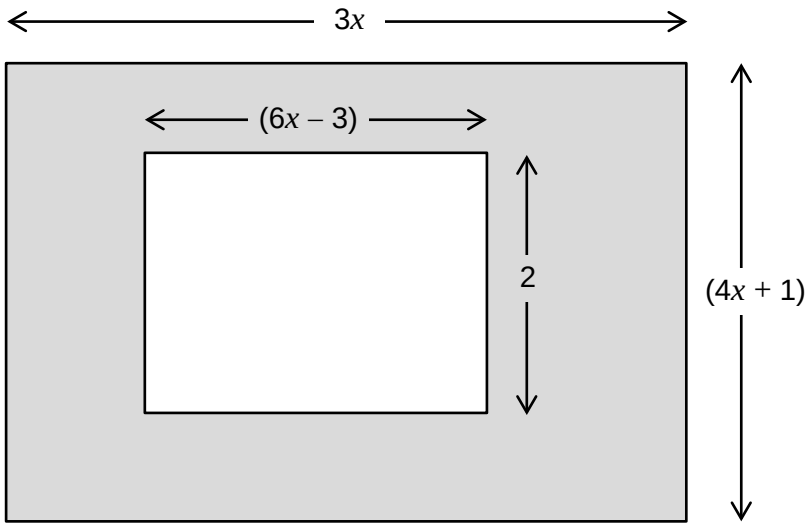
[4 marks]

Answer _____ years

16 The diagram shows two rectangles.

All lengths are in centimetres.

Not drawn accurately



16 (a) Show that the shaded area, in cm^2, is given by $12x^2 - 9x + 6$

[2 marks]

16 (b) The shaded area is 6 cm^2

Calculate the value of x.

[3 marks]

Answer _____

17 (a) Expand $x^2(x - 2)$

[2 marks]

Answer _____

17 (b) A curve has equation $y = x^2(x - 2)$

Work out the gradient of the curve at the point (3, 9).

[3 marks]

_____

_____

_____

_____

Answer _____

17 (c) Line *L* is the tangent to the curve $y = x^2(x - 2)$ at the point (3, 9).

Work out the equation of *L*.

Give your answer in the form $y = mx + c$

[2 marks]

_____

_____

_____

_____

Answer _____

18 Work out an expression for the nth term of the quadratic sequence.

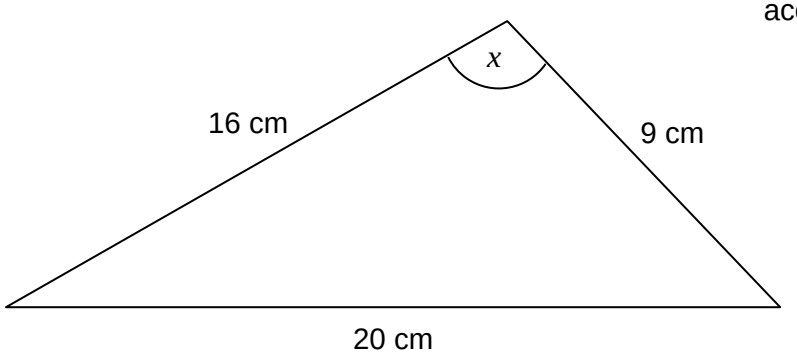
[4 marks]

11 15 21 29 39 ……

nth term = _____

19

Not drawn accurately



Work out angle x.

[3 marks]

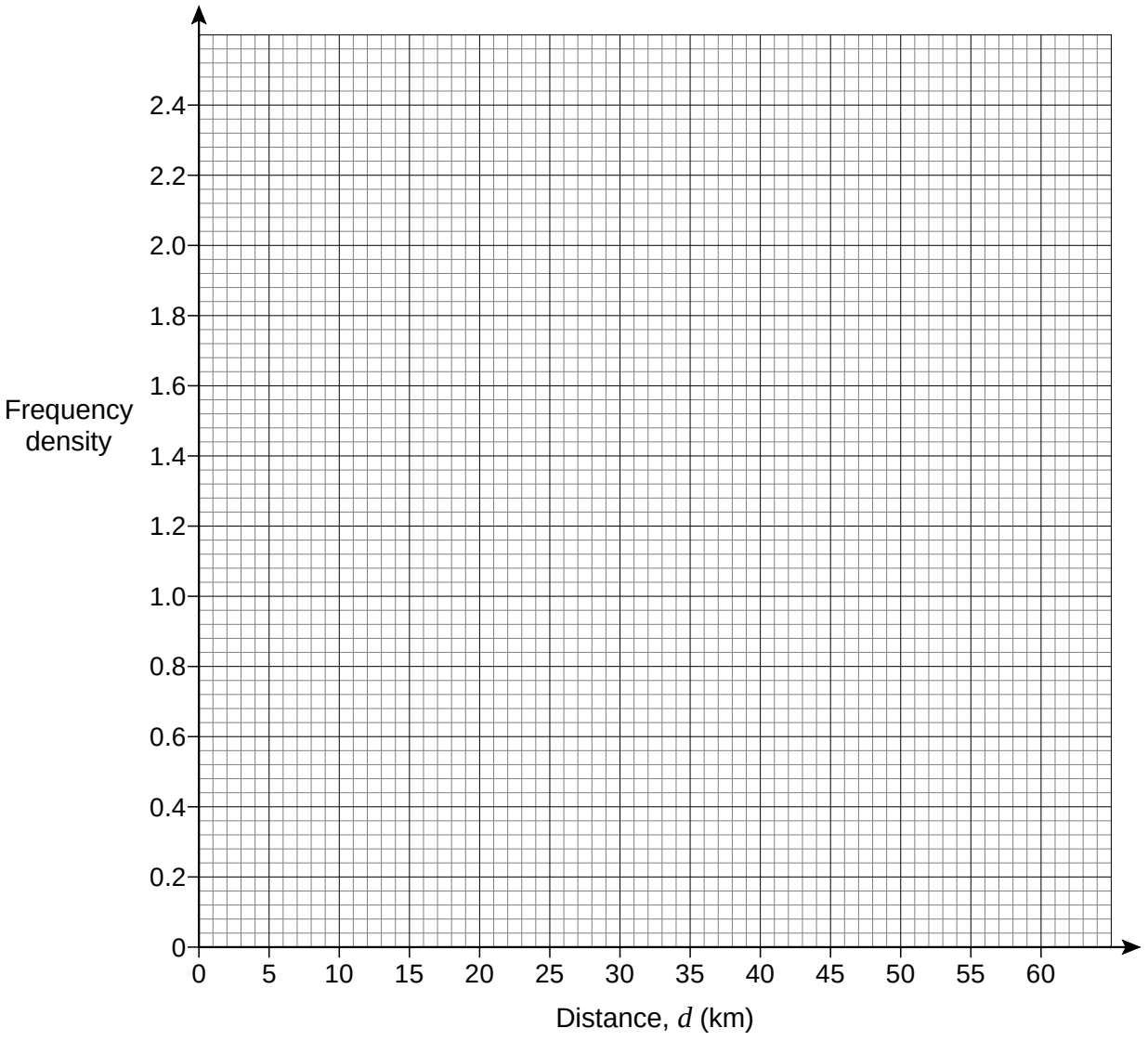
Answer x = _____ degrees

20 This table shows information about the distances employees travel to work.

Distance, d (km)	**Frequency**
$0 < d \leqslant 10$	17
$10 < d \leqslant 15$	12
$15 < d \leqslant 30$	3
$30 < d \leqslant 60$	9

Draw a histogram to show this information.

[3 marks]



21 (a) n is an integer.

Write down the next odd number after $2n + 1$

[1 mark]

Answer _____

21 (b) Prove that the difference between the squares of consecutive odd numbers is a multiple of 8

[3 marks]

22 For all values of x, $f(x) = x^2 + 1$ $g(x) = x - 5$

22 (a) Show that $fg(x) = x^2 - 10x + 26$

[2 marks]

22 (b) Solve $fg(x) = gf(x)$

[4 marks]

$x =$ _____

23 A dish contains some bacteria.

An antibiotic is added to the dish.

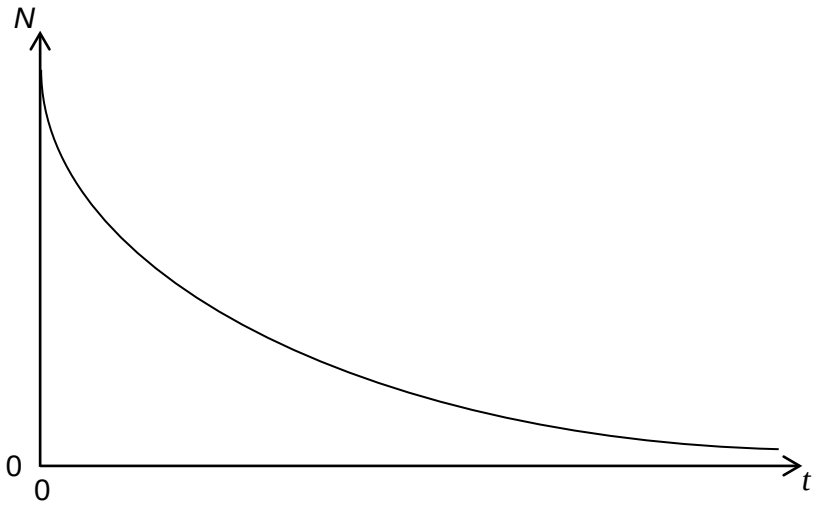
The antibiotic reduces the number of bacteria in the dish.

N is the number of bacteria t hours after the antibiotic is added.

The relationship between N and t is modeled by

$$N = 12\,000a^t$$ where a is a positive constant.

A sketch graph of $N = 12\,000a^t$ is shown



23 (a) Show that there are 12 000 bacteria in the dish when the antibiotic is added.

[1 mark]

23 (b) There are 6144 bacteria in the dish after 3 hours.

Work out the value of a.

[2 marks]

Answer _____

23 (c) Show that approximately one-sixth of the bacteria are left in the dish after 8 hours.

[1 mark]

24 The maximum safe load of a bridge is 1500 kg to the nearest 10 kg

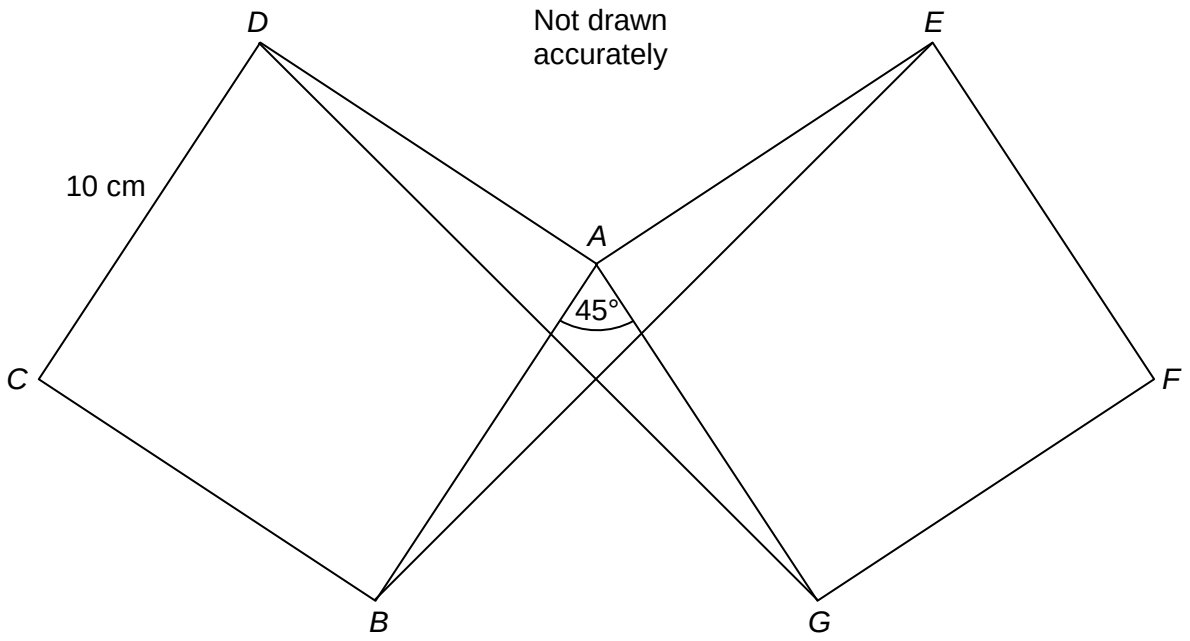
The mass of an average man is 75 kg to the nearest kilogram.

Work out an estimate for the maximum number of men that can **safely** cross the bridge at the same time.

[5 marks]

Answer _____

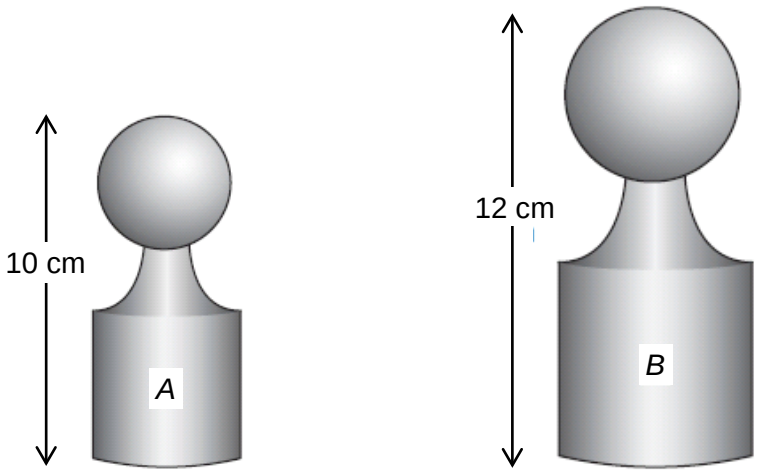
25 *ABCD* and *AEFG* are identical squares of side 10cm



Prove that triangles *AGD* and *ABE* are congruent.

[4 marks]

26 *A* and *B* are two similar solids.



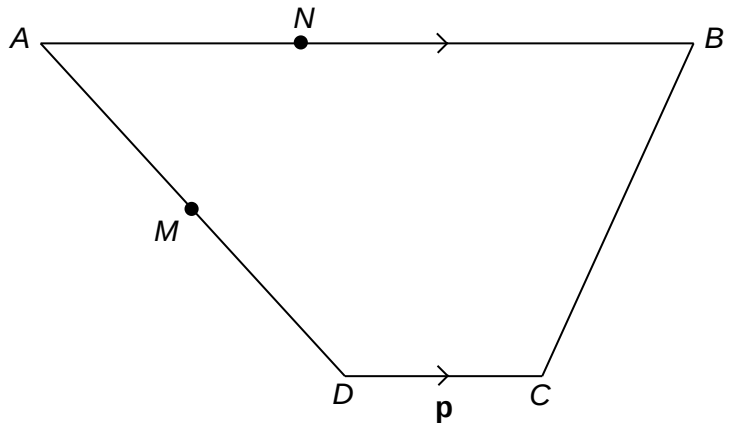
The volume of *A* is 500 cm^3

Work out the volume of *B*.

[3 marks]

Answer _____ cm^3

27 *AB* is parallel to *DC*.



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$\overrightarrow{AB} = 5\mathbf{p}$

$\overrightarrow{DC} = \mathbf{p}$

$\overrightarrow{DA} = 2\mathbf{q} - \mathbf{p}$

27 (a) Show that $\overrightarrow{CB} = 2\mathbf{q} + 3\mathbf{p}$

[1 mark]

27 (b) *M* is the midpoint of *AD*.

$\overrightarrow{AN} : \overrightarrow{NB} = 2 : 3$

Show that *MN* is parallel to *CB*.

[4 marks]

28 Solve the simultaneous equations.

$4x + y = -3$ and $y = x^2 + 2x + 5$

Do **not** use trial and improvement.

[6 marks]

Answer _____

END OF QUESTIONS.

There are no questions printed on this page

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