

Please check the examination details below before entering your candidate information

Candidate surname

Other names

Centre Number

Candidate Number

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

Time 1 hour 30 minutes

Paper
reference

1MA1/1H

Mathematics

PAPER 1 (Non-Calculator)

Higher Tier

You must have: Ruler graduated in centimetres and millimetres, protractor, pair of compasses, pen, HB pencil, eraser.
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 ►

Answer ALL questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

1 (a) Work out 4.66×4.9

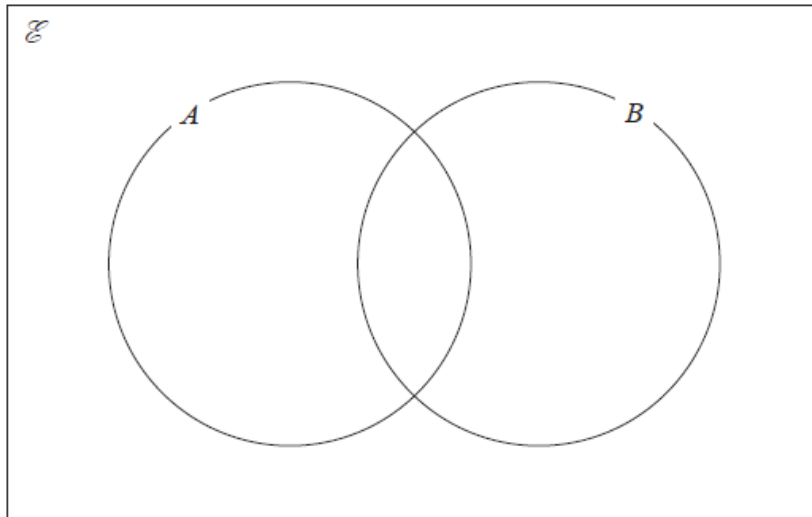
.....
(3)

(b) Work out $77.22 \div 1.8$

.....
(3)

(Total for Question 1 is 6 marks)

- 2 $\mathcal{E} = \{\text{odd numbers between 0 and 21}\}$
 $A = \{7, 13, 19, 21\}$
 $B = \{3, 7, 15, 19\}$
Complete the Venn diagram for this information.



(Total for Question 2 is 3 marks)

- 3 Work out $3\frac{2}{5} - 1\frac{2}{3}$

Give your answer as a mixed number.

.....
(Total for Question 3 is 3 marks)

- 4 At the end of 2017
the value of Tom's car was £25 000
the value of Jim's car was £16 000

At the end of 2020
the value of Tom's car had decreased by 30%
the value of Jim's car had increased by 10%

At the end of 2020, whose car had the greater value?
You must show how you get your answer.

(Total for Question 4 is 4 marks)

5 Jane, Katie and Lucy grow tomatoes.

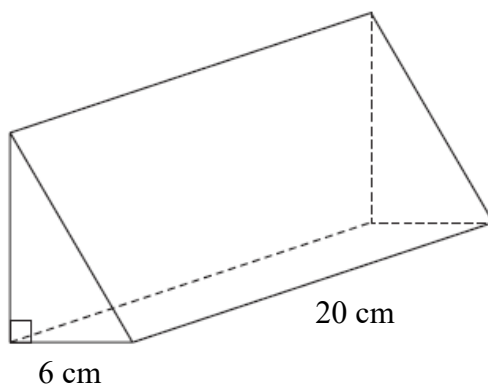
$$\begin{array}{l} \text{number of} \\ \text{tomatoes Jane has} \end{array} : \begin{array}{l} \text{number of} \\ \text{tomatoes Katie has} \end{array} : \begin{array}{l} \text{number of} \\ \text{tomatoes Lucy has} \end{array} = 3 : 8 : 14$$

Lucy has 18 more tomatoes than Katie.

Lucy has more tomatoes than Jane.
How many more?

.....
(Total for Question 5 is 3 marks)

6 The diagram shows a prism.



The cross section of the prism is a right-angled triangle.
The base of the triangle has length 6 cm

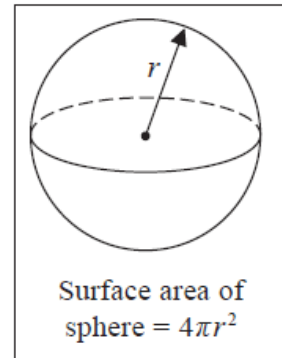
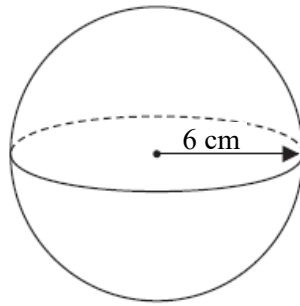
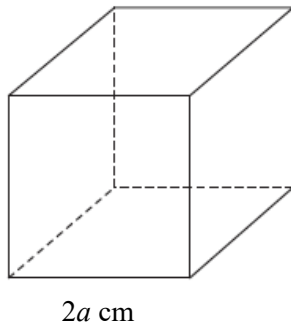
The prism has length 20 cm
The prism has volume 600 cm^3

Work out the height of the prism.

..... cm

(Total for Question 6 is 3 marks)

- 7 The diagram shows a cube with edges of length $2a$ cm and a sphere of radius 6 cm.



The surface area of the cube is equal to the surface area of the sphere.

Show that $a = \sqrt{k\pi}$ where k is an integer.

(Total for Question 7 is 4 marks)

- 8 Solve $x^2 = 3x + 28$

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

9 (a) Write down the value of 9^0

.....
(1)

(b) Find the value of $5 \times 5^5 \times 5^{-5}$

.....
(1)

(c) Find the value of 3^{-4}

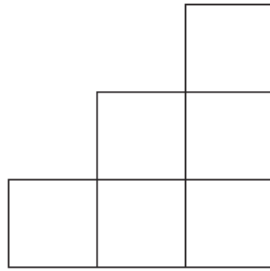
.....
(1)

(d) Find the value of $64^{\frac{1}{3}}$

.....
(1)

(Total for Question 9 is 4 marks)

10 The diagram shows a shape made from 6 identical squares.



The total area of the shape is 9576 cm^2

- (a) Find an estimate for the length of one side of each square.
Give your answer correct to the nearest whole number.

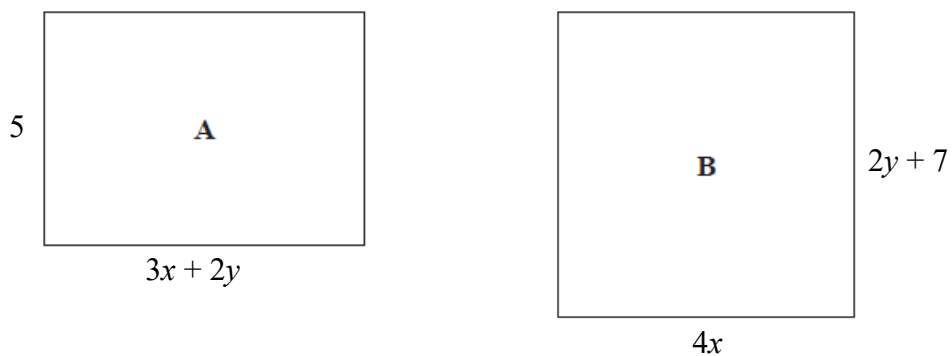
..... cm
(3)

- (b) Is your answer to part (a) an underestimate or an overestimate?
You must give a reason for your answer.

.....
.....
.....
(1)

(Total for Question 10 is 4 marks)

11 The diagram shows two rectangles, **A** and **B**.



All measurements are in centimetres.

The area of rectangle **A** is equal to the area of rectangle **B**.

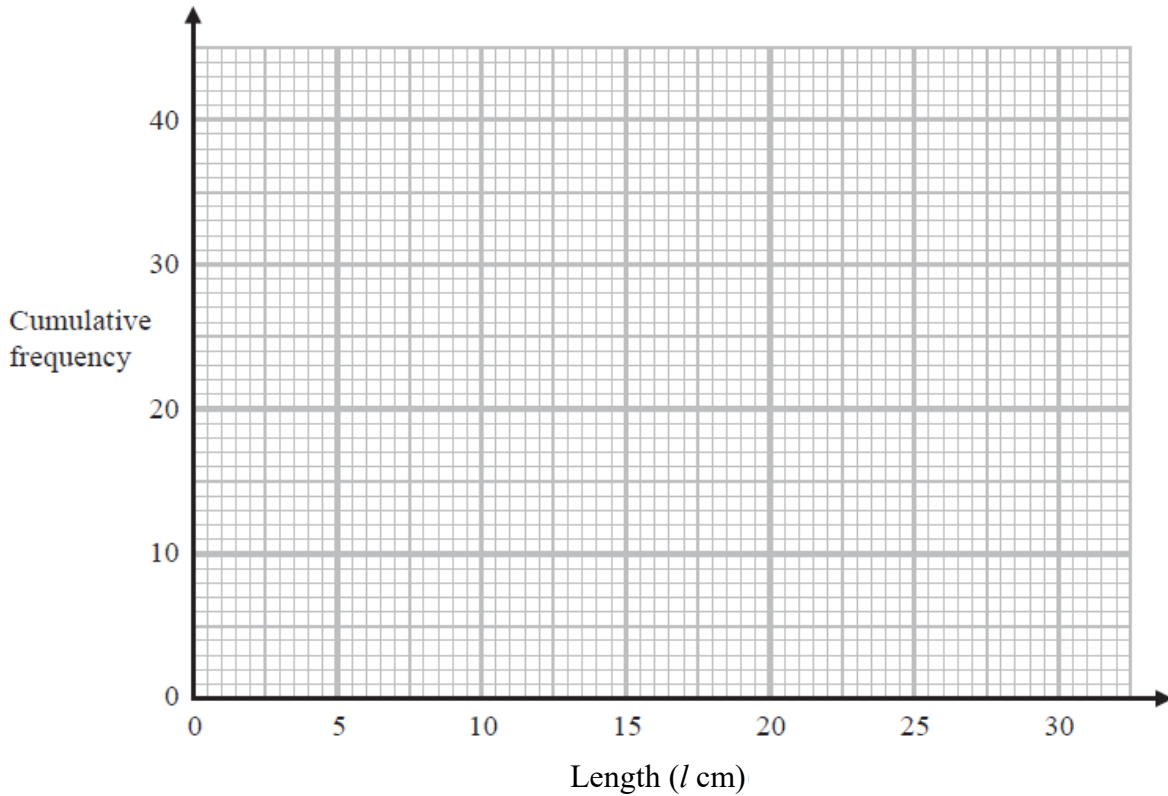
Find an expression for y in terms of x .

.....
(Total for Question 11 is 4 marks)

12 The cumulative frequency table gives information about the lengths, in cm, of 40 snakes.

Length (l cm)	Cumulative Frequency
$0 < l \leq 5$	4
$0 < l \leq 10$	7
$0 < l \leq 15$	13
$0 < l \leq 20$	30
$0 < l \leq 25$	38
$0 < l \leq 30$	40

(a) On the grid, draw a cumulative frequency graph for this information.



(2)

(b) Use the graph to find an estimate for the median length of the snakes.

..... cm
(1)

(Total for Question 12 is 3 marks)

13 Tony is trying to change $0.\dot{3}6\dot{2}$ to a fraction.

Here is the start of his method.

$$\begin{aligned}x &= 0.\dot{3}6\dot{2} \\100x &= 36.2\dot{3}6\dot{2} \\100x - x &= 36.2\dot{3}6\dot{2} - 0.\dot{3}6\dot{2}\end{aligned}$$

Evaluate Tony's method so far.

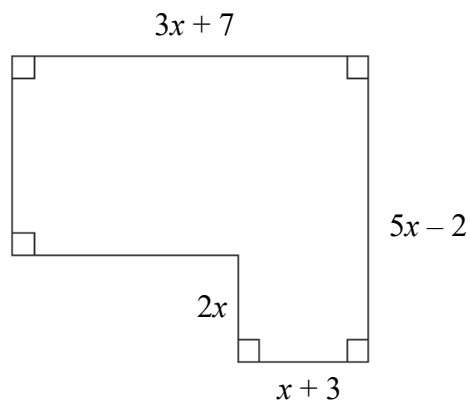
.....

.....

.....

(Total for Question 13 is 1 mark)

14 Here is a shape with all its measurements in metres.



The area of the shape is $S \text{ m}^2$

Show that $S = 11x^2 + 21x - 14$

(Total for Question 14 is 3 marks)

15 Show that $\frac{5x+2}{3x} + \frac{1}{2}$ can be written in the form $\frac{ax+b}{cx}$ where a, b and c are integers.

(Total for Question 15 is 3 marks)

16 There are only 4 orange sweets and 6 yellow sweets in a box.

Hannah takes at random 3 sweets from the box.

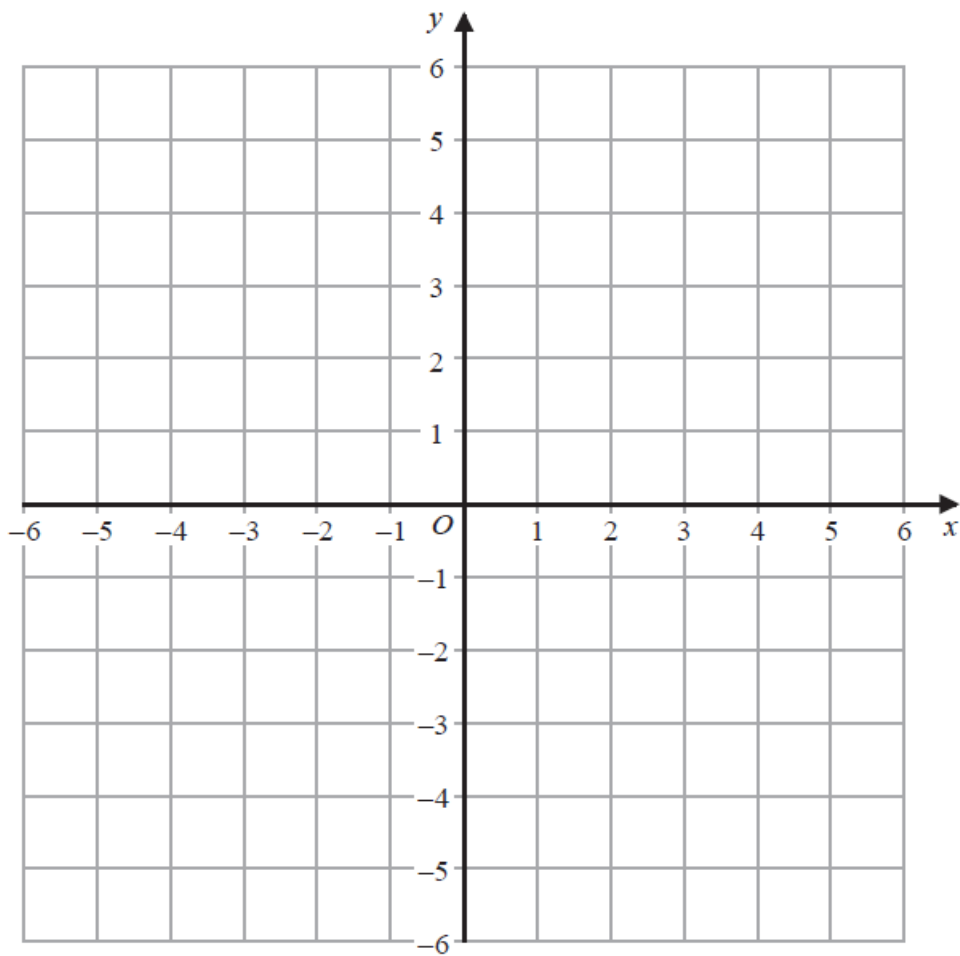
Work out the probability that she takes exactly one orange sweet.

.....
(Total for Question 16 is 4 marks)

17 On the grid show, by shading, the region that satisfies all of these inequalities.

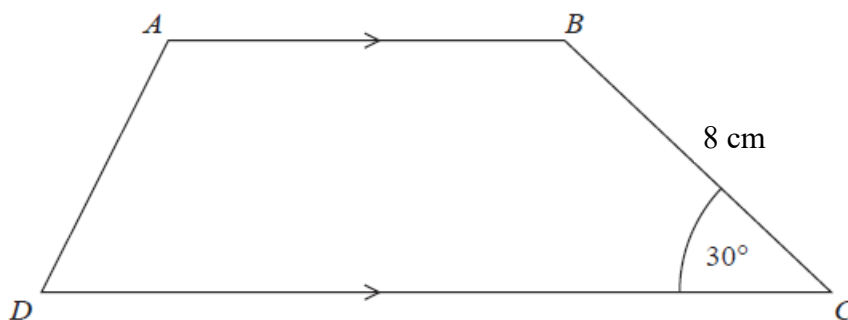
$$3y + 3 < x \quad x < 4 \quad y < 6 - 2x$$

Label the region **R**.



(Total for Question 17 is 3 marks)

18 Here is trapezium $ABCD$.



The area of the trapezium is 70 cm^2

the length of AB : the length of $CD = 3 : 4$

Find the length of AB .

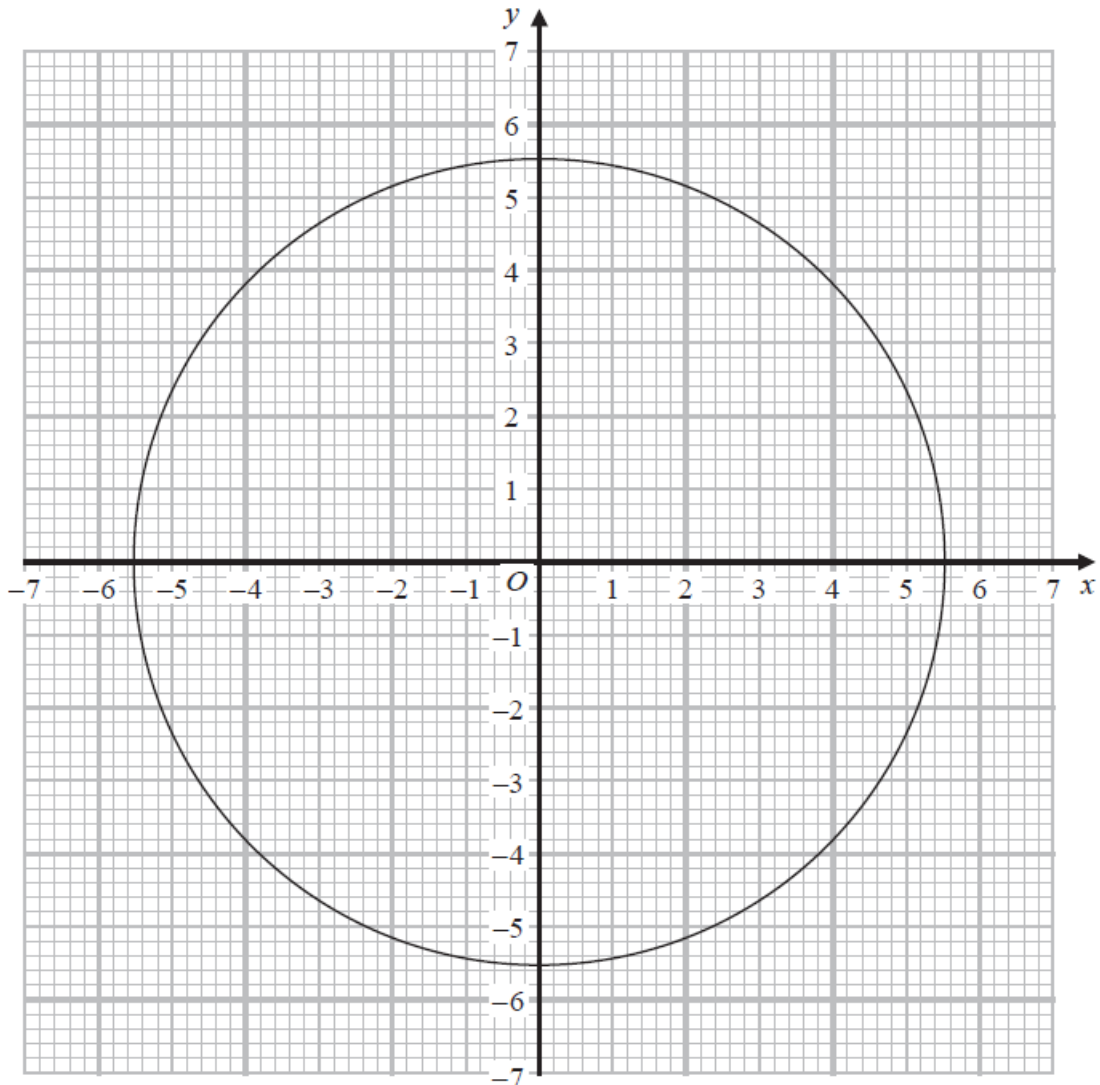
..... cm

(Total for Question 18 is 5 marks)

- 19** Show that $\frac{8 + \sqrt{18}}{6 + \sqrt{2}}$ can be written in the form $\frac{a + b\sqrt{2}}{c}$ where a , b and c are integers.
Give your answer in its simplest form.

(Total for Question 19 is 4 marks)

20 The diagram shows the graph of $x^2 + y^2 = 30.25$



Use the graph to find estimates for the solutions of the simultaneous equations

$$\begin{aligned}x^2 + y^2 &= 30.25 \\ y - 3x &= 2\end{aligned}$$

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

21 The functions f and g are such that

$$f(x) = 2x^2 + 1 \text{ for } x > 0 \quad \text{and} \quad g(x) = \frac{9}{x} \text{ for } x > 0$$

(a) Work out $gf(2)$

.....
(2)

The function h is such that $h = (fg)^{-1}$

(b) Find $h(x)$

.....
(4)

(Total for Question 21 is 6 marks)

- 22 Find the coordinates of the turning point on the curve with equation $y = 50 + 20x - 2x^2$
You must show all your working.

(..... ,)

(Total for Question 22 is 4 marks)

TOTAL FOR PAPER IS 80 MARKS