165135018751.tex

1 Which of these has the least value?

Circle your answer.

3.27×10^{-4} 0.0000327 326.8×10^{-6} 3.3×10^{-5}

(Total for Question 1 is 1 marks)

464195826906.tex

2 Simplify $5^7 \times 5^3$.

Circle the answer.

5^{21} 25^{21} 5^{10} 25^{10}

(Total for Question 2 is 1 marks)

640183974758.tex

3 The first 5 terms of a sequence are shown in the table.

71	65	59	53	47

Circle the expression for the nth term.

$6n + 65$ $n - 6$ $77 - 6n$ $6n - 76$

(Total for Question 3 is 1 marks)

4 Consider the equation $y = \frac{3}{2x}$.

If the value of x halves, what happens to the value of y?

Circle your answer.

$\div 2$ $\times 2$ $\div 4$ $\times 4$

(Total for Question 4 is 1 marks)

298141594932.tex

5 (a) Factorise $x^2 + 6x + 9$.

.....

Answer .....

(1)

(b) Solve $8y - 2 \geq 2y + 10$.

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Answer .....

(2)

(Total for Question 5 is 3 marks)

6 Barbara works out the answer to $-4\left(8.5-\sqrt{50.4}\right)$.
She says the answer is positive.

Is she correct?

You must show your working.

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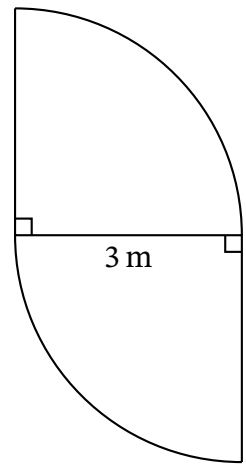
(Total for Question 6 is 2 marks)

7 The diagram shows two quarter circles with radii 3 m.



Calculate the total area of the shape.

Give your answer in terms of π.

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.....

Answer ..... m^2

(Total for Question 7 is 2 marks)

868173150364.tex

8 Calculate $\left(4^{\frac{1}{2}}\right)^2 \times \left(9^{\frac{1}{2}}\right)^2$.

.....

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Answer .....

(Total for Question 8 is 2 marks)

847103812494.tex

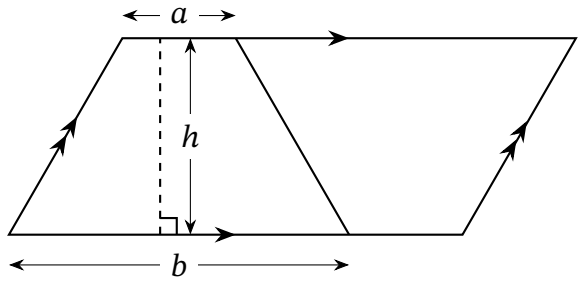
9 Which of the following expressions can be used to calculate the sum of three consecutive odd numbers?

Circle your answer.

$3(2n + 2)$ $3(2n + 1)$ $6n + 1$ $2n + 9$

(Total for Question 9 is 1 marks)

10 (a) Two identical trapeziums have been placed together to form a parallelogram.



By first calculating an expression for the area of the parallelogram in terms of a, b, and h, show that the formula for the area of the trapezium is $\frac{1}{2}(a+b)h$.

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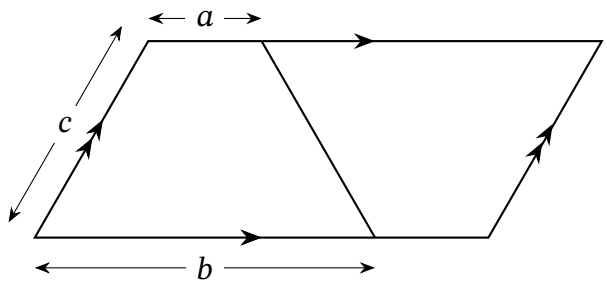
(2)

(b) Given that $a : b = 1 : 3$ and $a : c = 1 : 2$, calculate the perimeter of the parallelogram in terms of a.



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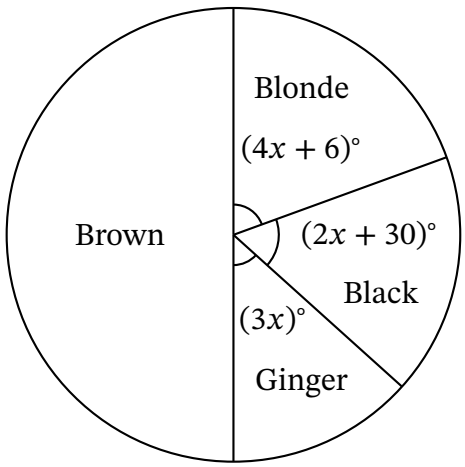
Answer ..... cm

(2)

(Total for Question 10 is 4 marks)

11 The pie chart shows the proportion of different hair colours in a year 8 class: exactly half the class have brown hair.



Calculate the probability that a person selected at random from the class would have black hair.

Answer .....

(Total for Question 11 is 4 marks)

12 Two sequences have the expressions $3n + 2$ and $4n - 1$ for the nth term.

Find three numbers between 30 and 60 which are in both sequences.

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Answer ....., ..., ...

(Total for Question 12 is 3 marks)

289167498160.tex

13 Solve the pair of equations

$$3x - 2y = 9.5,$$
$$x - y = 2.$$

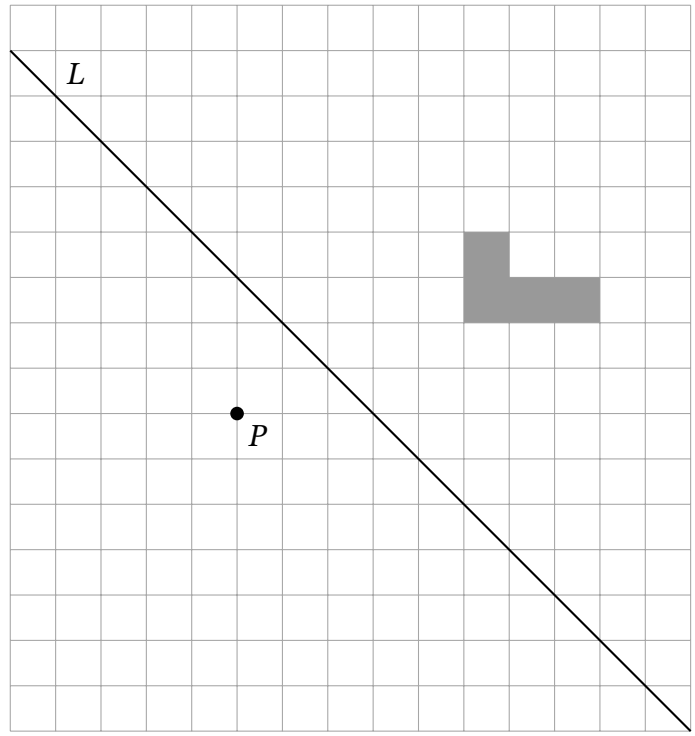
Answer $x =$ .....

Answer $y =$ .....

(Total for Question 13 is 3 marks)

14 Reflect the shaded shape in the line L. Label this shape A.

Then, enlarge shape A by scale factor -2, centre P. Label this shape B.



(Total for Question 14 is 3 marks)

15 When Michael gets dressed one morning, he randomly chooses one T-shirt, one pair of trousers, and one pair of socks.

Michael has 10 T-shirts, 4 pairs of trousers, and 9 pairs of socks.

(a) How many different combinations of clothes could he choose?

.....

.....

Answer .....

(2)

(b) Two of the T-shirts and two of the pairs of socks are red.

Work out the probability that Michael chooses a red T-shirt **and** red socks.
Give your answer as a fraction.

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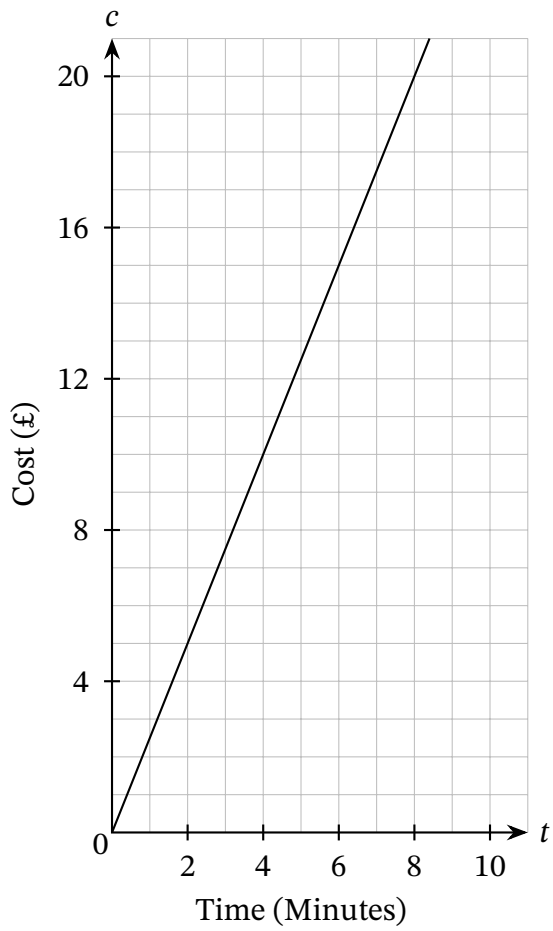
Answer .....

(2)

(Total for Question 15 is 4 marks)

642158210145.tex

16 The charge for a phone call made abroad is shown in the graph.



What was the price per minute of the phone call?
Circle your answer.

£2.50 £0.25 £20 £15

(Total for Question 16 is 1 marks)

964190354840.tex

17 The shapes K and L are two similar cylinders.
The height of cylinder K is three times the height of cylinder L.

Jacob says that the area of the circular face of cylinder K must be three times the area of the circular face of cylinder L.

Is Jacob correct?
Tick the correct box.

Yes ☐

No ☐

Give a reason for your answer.

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(Total for Question 17 is 1 marks)

125181345150.tex

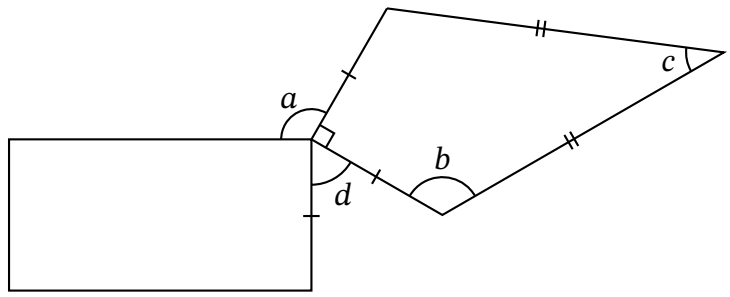
18 Circle the **two** roots of the equation $(x - 3)(4 - 3x) = 0$.

-3 $\quad$ 3 $\quad$ $\frac{4}{3}$ $\quad$ $-\frac{4}{3}$

(Total for Question 18 is 1 marks)

945107540423.tex

19 The diagram shows a kite and a rectangle.



Given that $a = b$, write an equation for d in terms of c.

Answer .....

(Total for Question 19 is 3 marks)

20 Some grandparents took their grandchildren to the swimming pool.
The ages of the people present in the swimming pool are shown in the grid.

4	6	5	7	3	58	61	70	62

Simon wants to find the average age of the people in the swimming pool.
Which average is the most appropriate?

Tick the correct box.

Median ☐

Mean ☐

Mode ☐

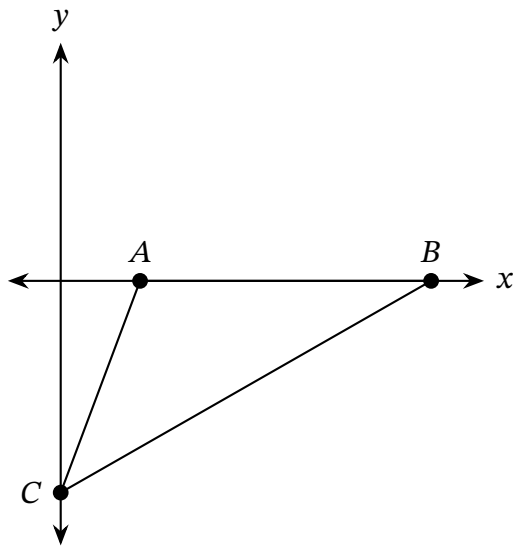
Give a single reason for why each of the other two averages would not be appropriate.

Reason 1 .....

Reason 2 .....

(Total for Question 20 is 2 marks)

21 A, B, and C are vertices of a triangle.



The triangle ABC has an area of 44 square units.

Work out three possible coordinates for A, B, and C.

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.....

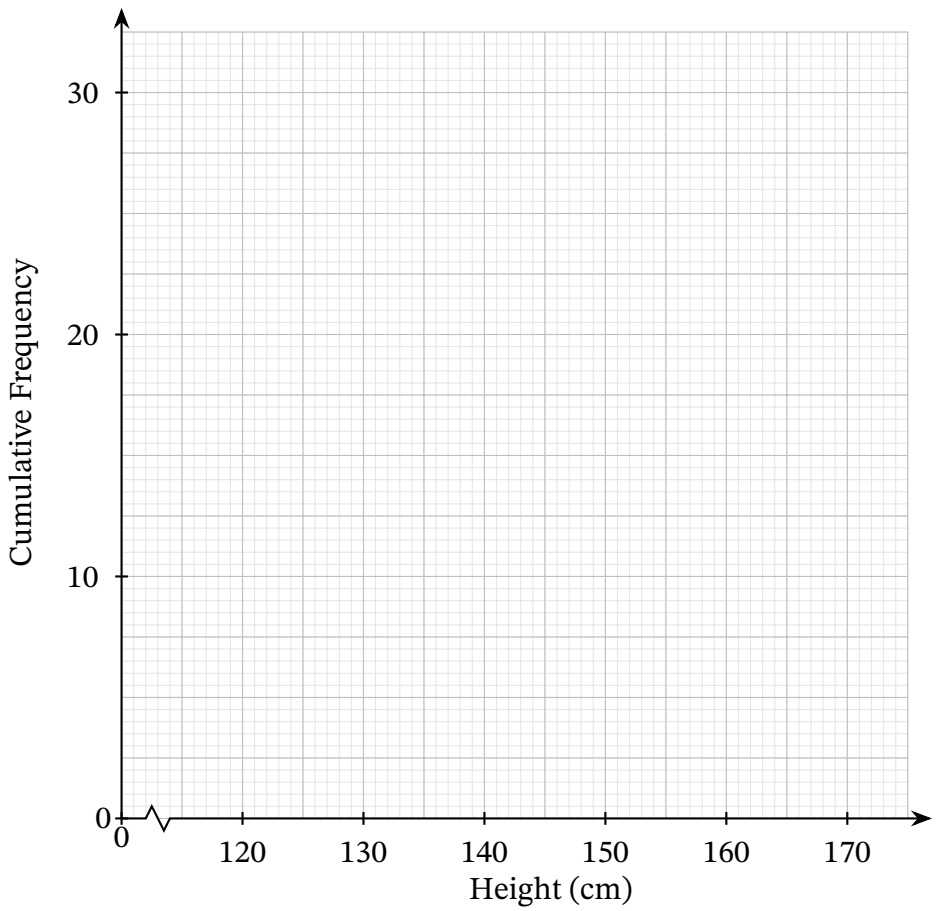
$A(..., ...)$ $B(..., ...)$ $C(..., ...)$

(Total for Question 21 is 2 marks)

22 The frequency table shows information about the heights of children in a Year 6 class.

Height, h (cm)	Frequency
$120 < h \leq 130$	2
$130 < h \leq 140$	8
$140 < h \leq 150$	12
$150 < h \leq 160$	7
$160 < h \leq 170$	1

(a) Draw a cumulative frequency graph on the grid.



(3)

(b) Estimate the lowest height of the tallest 25% of students in the class.

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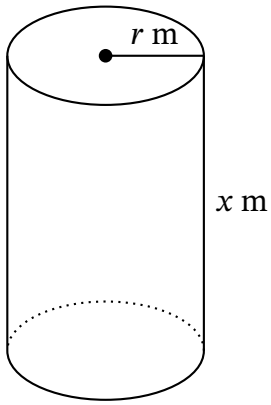
23 A curve has the equation $y = (x - 3)^2 - 4$.

Find the coordinates of the turning point of the curve.
Circle your answer.

$(3, -4)$ $(3, 4)$ $(-3, 4)$ $(-3, -4)$ $(4, 3)$

(Total for Question 23 is 1 marks)

24 A cylinder has a length of x m and the radius of its base is r m.



The length x is increased by 20%.

The radius r is decreased by 40%.

Calculate and describe the percentage change in the volume of the cylinder.

Answer .....

(Total for Question 24 is 4 marks)

396160985674.tex

25 Convert $0.2\dot{2}5\dot{3}$ to a fraction in its simplest form.

Answer .....

(Total for Question 25 is 3 marks)

26 In a school, you can wear summer shirts or normal shirts.

In Year 7, the ratio of boys to girls is 2 : 3.

25% of the girls are wearing summer shirts.
40% of the boys are wearing summer shirts.

62 children are wearing summer shirts.

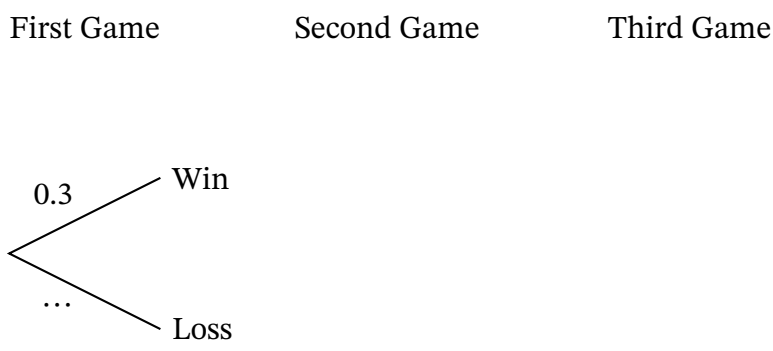
Work out the total number of children in Year 7.

Answer .....

(Total for Question 26 is 4 marks)

27 Dom is taking part in a card tournament.
He plays three games, and the probability that he wins each game is 0.3.
Assume each game is independent.

(a) Complete the tree diagram.



(2)

To qualify for the next stage of the tournament, Dom needs to win at least 2 games.

(b) Calculate the probability that after the third game, Dom qualifies for the next stage by winning **exactly** two games.

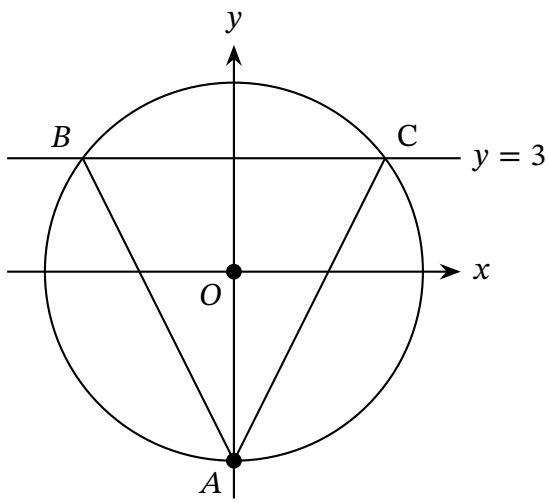
Answer .....

(2)

(Total for Question 27 is 4 marks)

28 The diagram shows the circle $x^2 + y^2 = 25$ and the line $y = 3$.

Points A, B, and C are points on the circumference of the circle; B and C lie on the line $y = 3$.
Point A is on the y-axis.



(a) Show that the coordinates of A are $(0, -5)$.

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(1)

(b) Find the coordinates of B and C.

.....

.....

$B(\ldots, \ldots)$ $C(\ldots, \ldots)$

(1)

(c) Find the area of triangle ABC.

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(2)

Answer .....

(d) Find the equation of the line AC.

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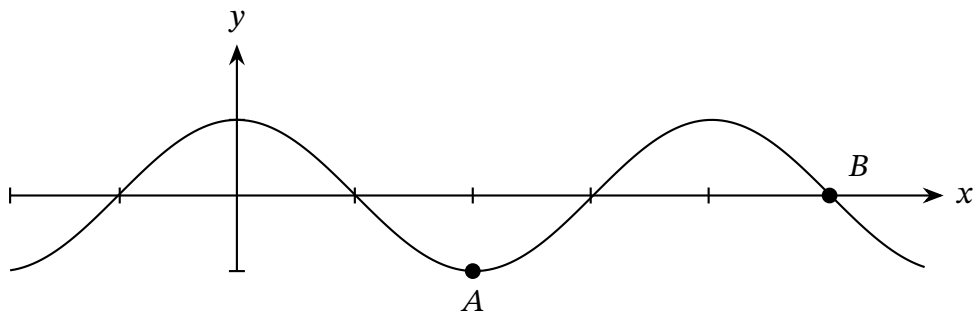
(3)

Answer .....

(Total for Question 28 is 7 marks)

29 The diagram shows a sketch of $y = \cos x^\circ$ for $-180 \leq x \leq 540$.



(a) Write down the coordinates of A.

Answer A (..., ...)

(1)

(b) Write down the coordinates of B.

Answer B (..., ...)

(1)

(Total for Question 29 is 2 marks)

30 (a) Calculate the value of $64^{-\frac{2}{3}}$.

Answer .....

(2)

(b) Write $27 \times \left(81^{k}\right)^{2}$ as a single power of 3 in terms of k.

Answer .....

(3)

(Total for Question 30 is 5 marks)