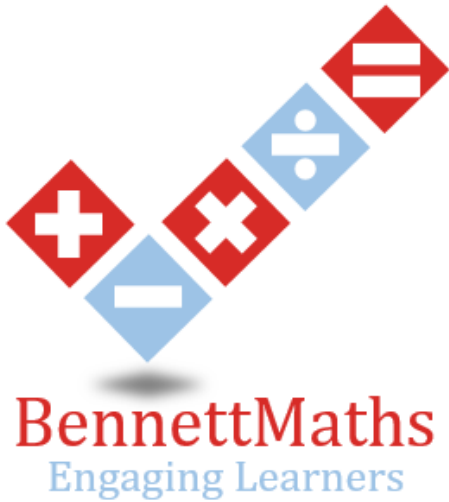


***BennettMaths will be live on TikTok the night before paper 3,
going through all the predicted papers.***

Tuesday 9th June at 8pm

Candidate surname

Other names



**Pearson
Edexcel**

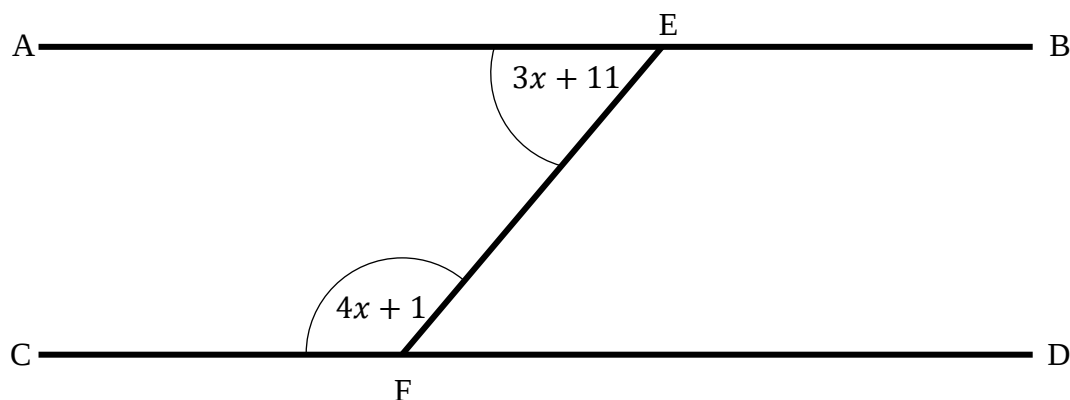
**Best Guess Paper –
3H
Calculator**

Within this booklet you will find my best guess at which topics might be on the third Edexcel Higher gcse maths paper.

There may be other topics that appear on paper 3, so please ensure that you continue to revise all topics.

The paper consists of 22 questions totalling 80 marks.

- 1 AB and CD are a set of parallel lines



Angle AEF = $3x + 11$

Angle CFE = $4x + 1$

Work out the size of x

$$3x + 11 + 4x + 1 = 180$$

$$7x + 12 = 180$$

$$7x = 168$$

$$x = 24$$

2

Solve algebraically

$$3x + 2y = 9.5$$

$$7x - 5y = 41.5$$

$$\begin{array}{r} \times 5 \\ \times 2 \end{array}$$

$$3(4.5) + 2y = 9.5$$

$$13.5 + 2y = 9.5$$

$$2y = -4$$

$$y = -2$$

$$+ 15x + 10y = 47.5$$

$$14x - 10y = 83$$

$$29x = 130.5$$

$$x = 4.5$$

(Total for Question 2 is 4 marks)

3 The frequency table below shows the pocket money received by 35 pupils.

Pocket Money	Frequency
$0 \leq x < 5$	7
$5 \leq x < 8$	8
$8 \leq x < 10$	16
$10 \leq x < 20$	4

$$\begin{array}{l} mp \\ 2.5 \\ 6.5 \\ 9 \\ 15 \end{array}$$

$$\begin{array}{l} mp \times f \\ 17.5 \\ 52 \\ 144 \\ 60 \end{array}$$

$$\begin{array}{r} 60 \\ \hline 273.5 \end{array}$$

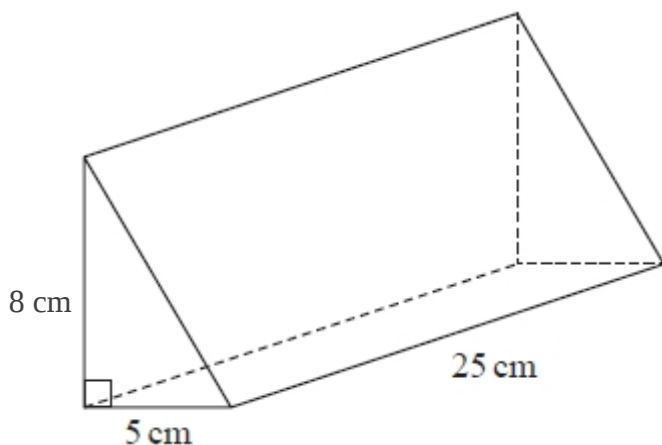
Work out an estimate for the mean amount of pocket money received by each pupil.

$$273.5 \div 35 = 7.81$$

(Total for Question 3 is 3 marks)

4

The diagram shows a prism.



The cross section of the prism is a right-angled triangle.

The base of the triangle has length 5 cm

The prism has length 25 cm

The mass of the prism is 250g.

Work out the density of the prism.

$$\frac{8 \times 5}{2} \times 25 = 500 \text{ cm}^3$$

$$250 \text{ g} : 500 \text{ cm}^3$$

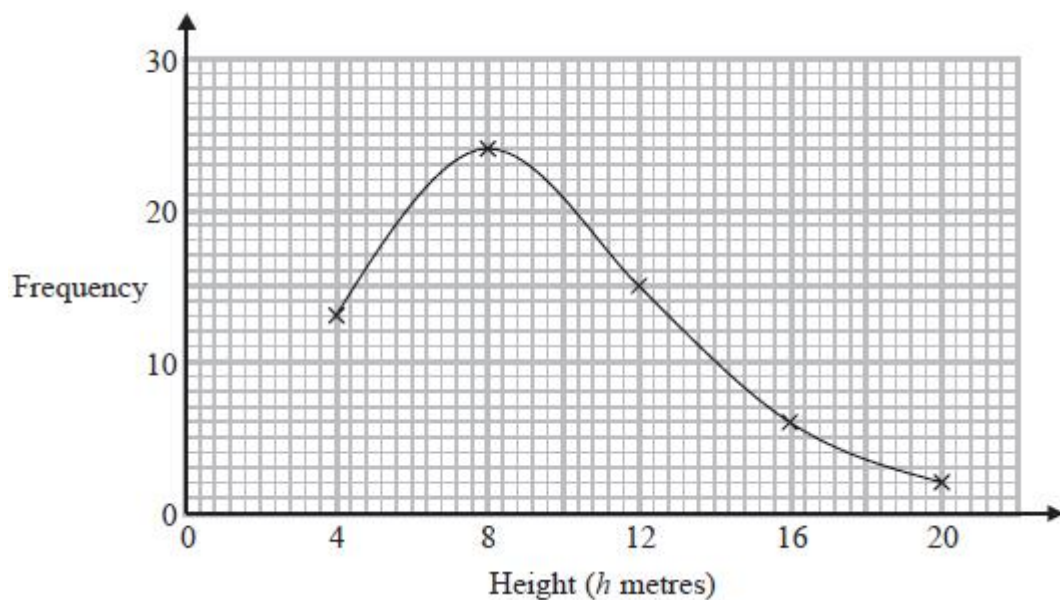
$$0.5 \text{ g} : 1 \text{ cm}^3$$

$$0.5 \text{ g/cm}^3$$

5 The table shows the heights of 60 trees

Height (h metres)	Frequency
$0 < h \leq 4$	13
$4 < h \leq 8$	24
$8 < h \leq 12$	15
$12 < h \leq 16$	6
$16 < h \leq 20$	2

Freddie plots the frequency polygon below



Write down 2 things that are wrong with this graph

1. Didn't use the midpoints
2. Should be straight lines

(Total for Question 5 is 2 marks)

- 6 L_1 is defined by $y = 3x + 4$
 L_2 is defined by $18y + 6x = 300$

Show that L_1 and L_2 are perpendicular.

$$L_1 \text{ gradient} = 3$$

$$L_2 \text{ gradient} = -\frac{1}{3}$$

$$3 \times -\frac{1}{3} = -1$$

$$18y = -6x + 300$$

$$y = \frac{-6}{18}x + \frac{300}{18}$$

$$\frac{-6}{18} = -\frac{1}{3}$$

(Total for Question 6 is 2 marks)

- 7 Margot lists her last ten test scores.

38, 44, 49, 52, 55, 59, 60, 67, 75, 99

Work out the interquartile range of her scores

$$67 - 49 = 18$$

(Total for Question 7 is 3 marks)

- 8 In the 2026 local elections in Lancaster, the Green Party candidate received 70% of the vote.

This represents a 25% increase since the last election.

Work out the percentage of votes received in the previous election.

$$70 = 125\%$$

$$56 = 100\%$$

$$56\%$$

(Total for Question 8 is 2 marks)

- 9 The ratio of Stephen's age : Shane's age: Paul's age is $3x : x + 2 : x^2 - 1$

The total of their ages is 141 years old.

Work out the age of Stephen

$$3x + x + 2 + x^2 - 1 = x^2 + 4x + 1$$

$$x^2 + 4x + 1 = 141$$

$$x^2 + 4x - 140 = 0$$

$$(x + 14)(x - 10) = 0$$

$$x = -14 \quad \boxed{x = 10}$$

$$3 \times 10 \\ = \underline{\underline{30}}$$

(Total for Question 9 is 4 marks)

- 10 The group frequency table gives information on the time taken, in minutes, for 80 students to complete their weekly maths homework.

Time (t minutes)	Frequency
$0 < t \leq 20$	5
$20 < t \leq 40$	30
$40 < t \leq 60$	20
$60 < t \leq 80$	15
$80 < t \leq 100$	8
$100 < t \leq 120$	2

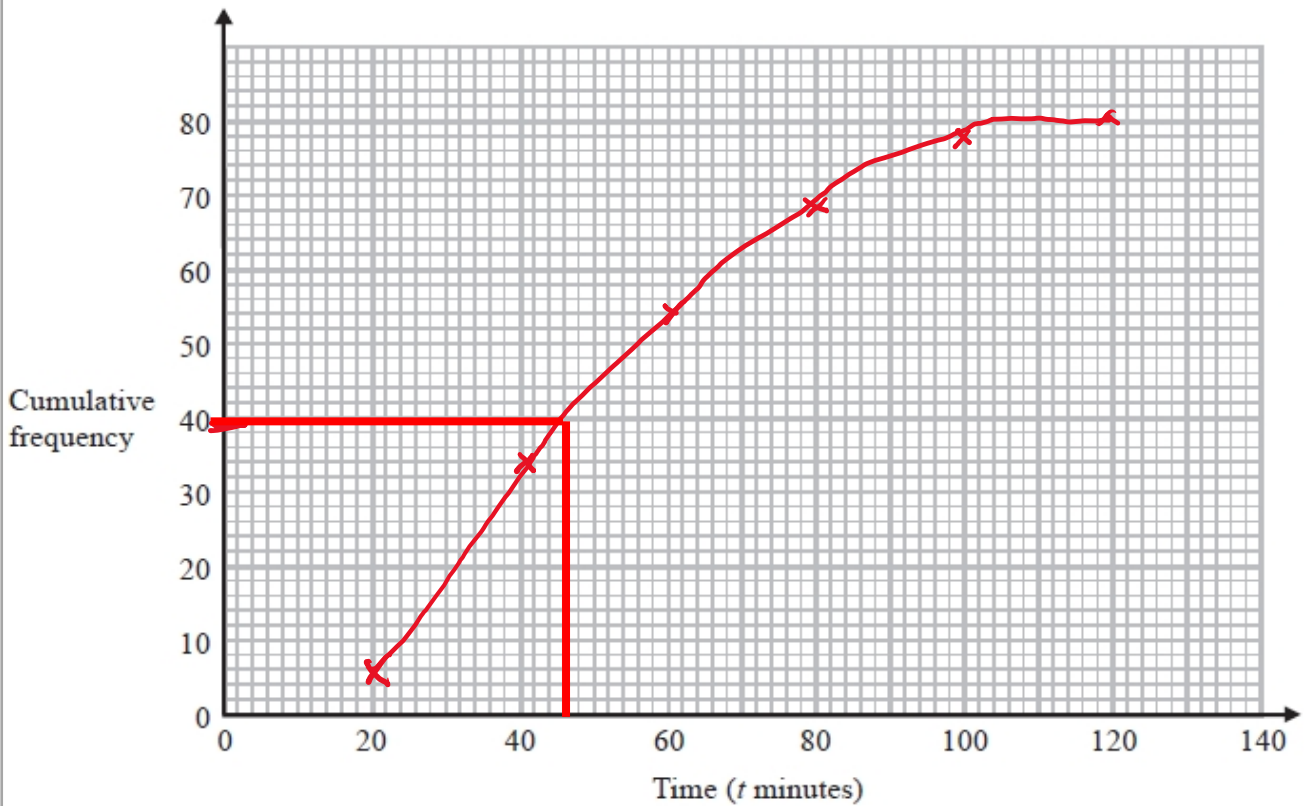
- (a) Complete the cumulative frequency table

Time (t minutes)	Cumulative frequency
$0 < t \leq 20$	5
$0 < t \leq 40$	35
$0 < t \leq 60$	55
$0 < t \leq 80$	70
$0 < t \leq 100$	78
$0 < t \leq 120$	80

(1)

- (b) On the grid, draw the cumulative frequency graph for this information

(2)



- (c) Using your graph, work out an estimate for the median time taken.

46

11 ABC is a straight line. AB:BC is in the ratio 3:5

The coordinates of A are $(12, -4)$

The coordinates of B are $(18, -6)$

Work out the coordinates of C

$$\begin{array}{ccccc} A & & B & & C \\ (12, -4) & & (18, -6) & & (28, -9\frac{2}{3}) \\ & \xrightarrow{\quad} & & \xrightarrow{\quad} & \\ & + & & + & \\ & (6, -2) & & (10, -\frac{10}{3}) & \end{array}$$

$$3 \text{ parts} = (6, -2)$$

$$1 \text{ part} = (2, -\frac{2}{3})$$

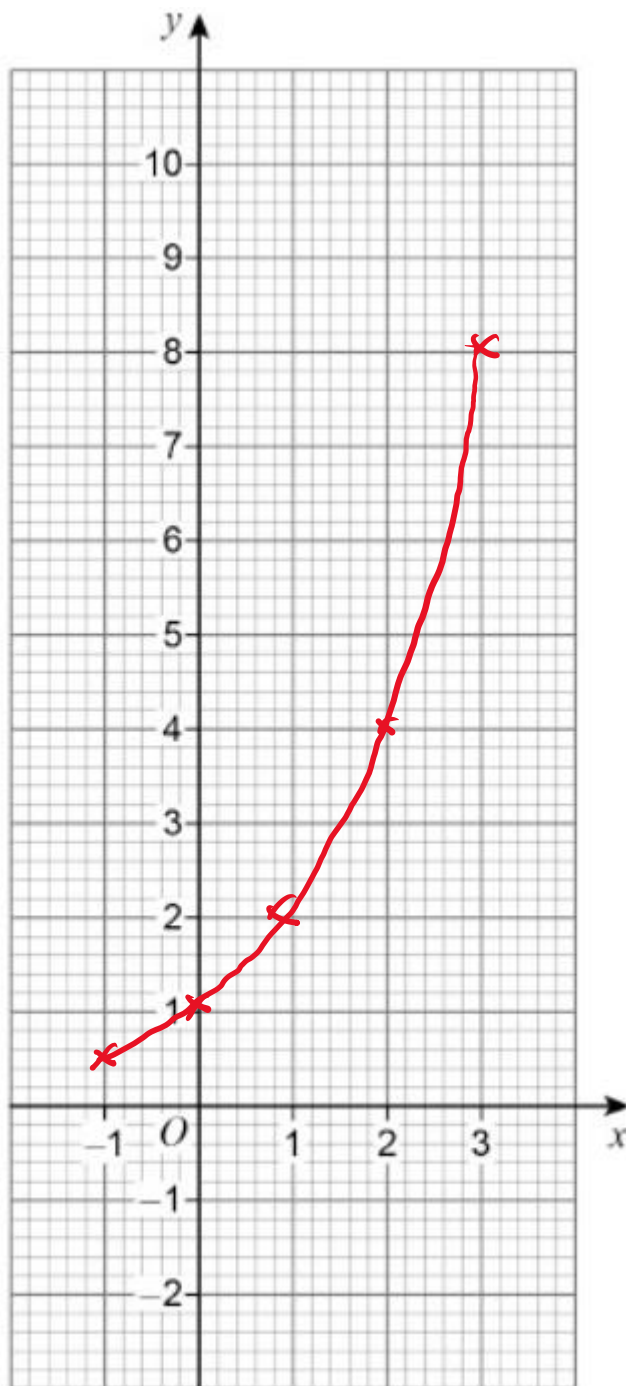
$$5 \text{ parts} = (10, -\frac{10}{3})$$

12(a) Complete the table of values of $y = 2^x$.

x	-1	0	1	2	3
y	0.5	1	2	4	8

(2)

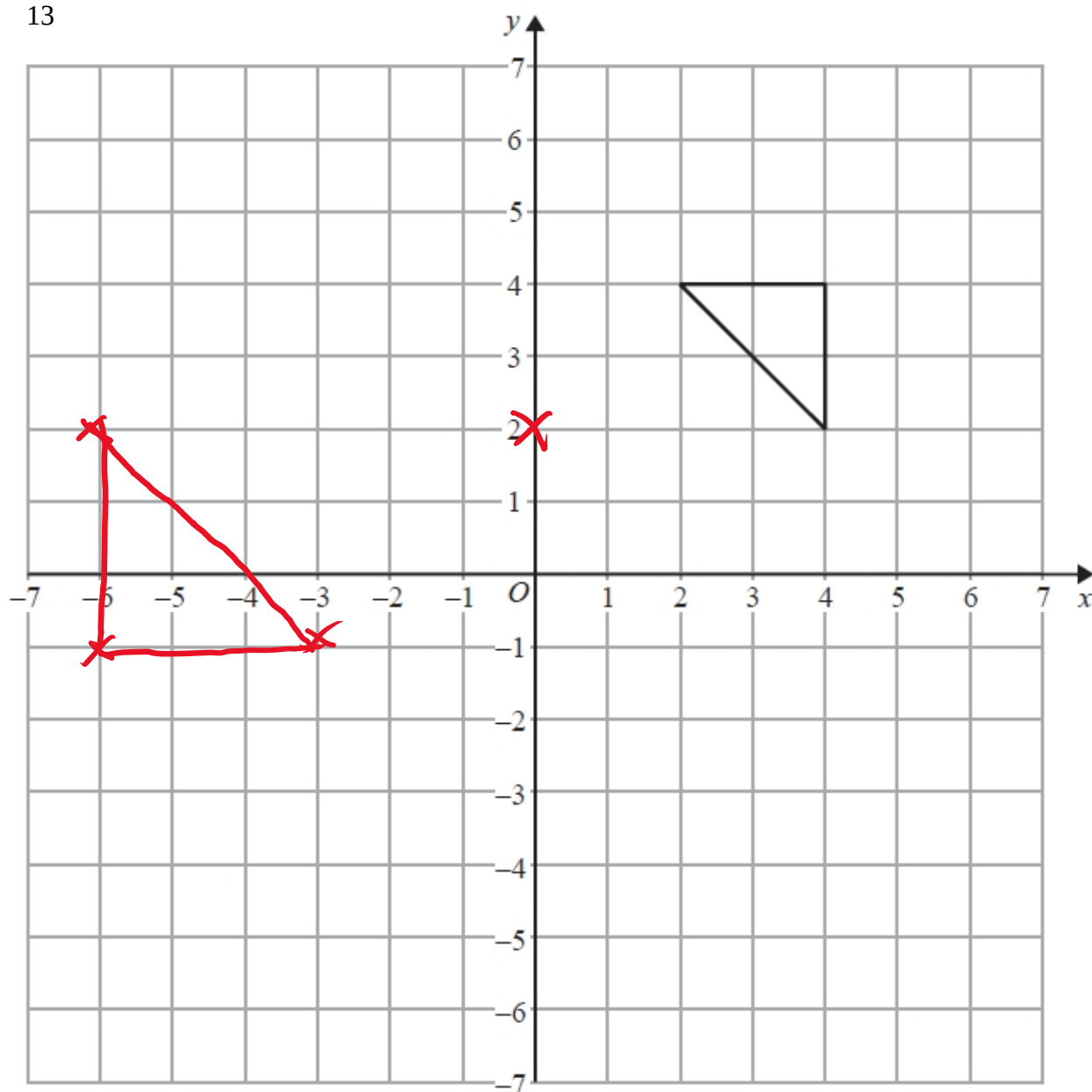
(b) Draw the graph of $y = 2^x$ for values of x from -1 to 3



(2)

(Total for Question 12 is 4 marks)

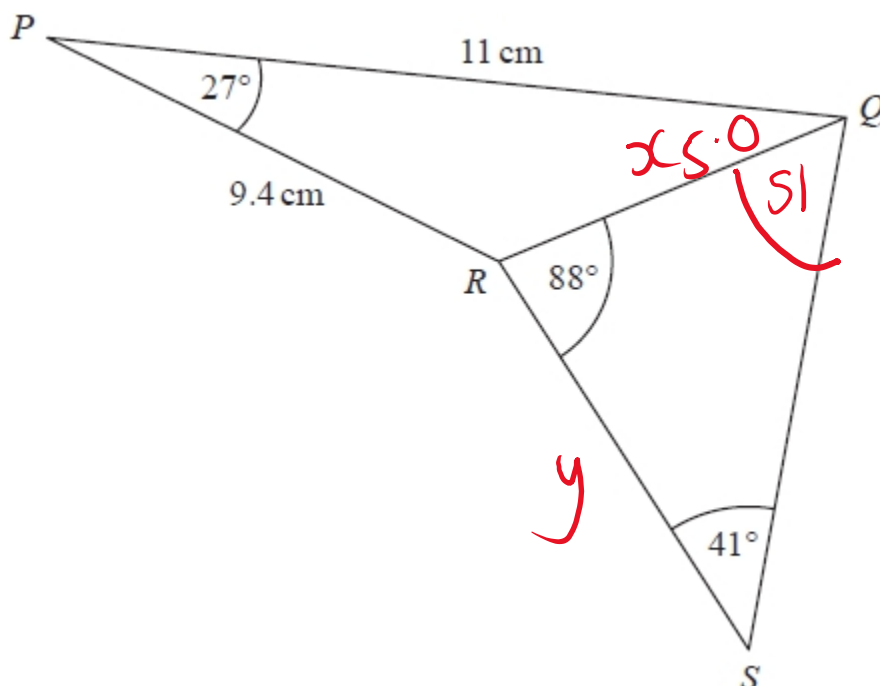
13



On the grid, enlarge the triangle by scale factor -1.5 with centre (0,2)

(Total for Question 13 is 3 marks)

14 PQR and QRS are triangles



Calculate the length of RS.

Give your answer correct to 3 significant figures.

You must show all of your working

$$x = \sqrt{9.4^2 + 11^2 - 2 \times 9.4 \times 11 \times \cos(27)}$$

$$x = 5.0$$

$$\frac{y}{\sin(51)} = \frac{5}{\sin(41)}$$

$$y = \frac{5}{\sin(41)} \times \sin(51)$$

$$5.92$$

(Total for Question 14 is 4 marks)

15 Here are the first four terms of a quadratic sequence.

$-3, 3, 13, 27$

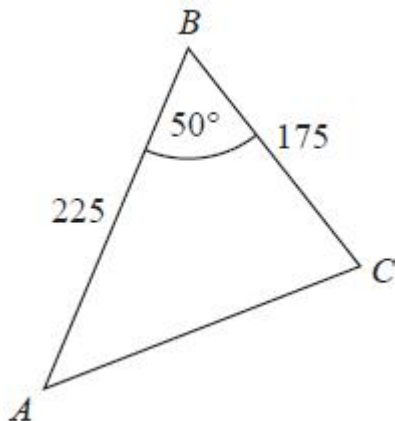
Work out an expression, in terms of n , for the n th term of the sequence

$$\begin{array}{r} -3, 3, 13, 27 \\ \rightarrow \rightarrow \rightarrow \\ +6 \quad +10 \quad +14 \\ \rightarrow \rightarrow \\ +4 \quad +4 \end{array} \quad 2n^2$$

$$\begin{array}{r} 2n^2 = 2, 8, 18 \\ -3, 3, 13 \\ -5, -5, -5 \end{array}$$

$$2n^2 - 5$$

16 Sam measures a field.



The length AB measures 225m correct to the nearest 5m

The length BC measures 175m correct to the nearest 5m

Angle ABC measures 50° correct to the nearest degree.

Work out the upper bound for the area of the field.

You must show your working.

LB	UB
222.5	227.5
172.5	177.5
49.5	50.5

$$\frac{1}{2} \times 227.5 \times 177.5 \times \sin(50.5)$$

$$= 15579.58$$

17

y is inversely proportional to d^4

When $y = 10$ and $d = 2$

d is directly proportional to $\sqrt{x}$

When $d = 20$ and $x = 25$

Write a formula for y in terms of x . Giving your answer in its simplest form

$$\begin{array}{l|l|l} y = \frac{k}{d^4} & d = k\sqrt{x} & y = \frac{160}{(4\sqrt{x})^4} \\ 10 = \frac{k}{2^4} & 20 = k\sqrt{25} & y = \frac{160}{256x^2} \\ 160 = k & k = 4 & \\ y = \frac{160}{d^4} & d = 4\sqrt{x} & y = \frac{5}{8x^2} \end{array}$$

- 18 The population of grey squirrels in Longridge in 2026 was 12,000.
Population growth is given by the following iterative formula

$$P_{n+1} = 1.04P_n + 180$$

Work out an estimate for the number of grey squirrels in Longridge in
2027, 2028 and 2029

$$\text{ANS} = 12000$$

$$1.04 \text{ ANS} + 180$$

Answers

2027

12660

2028

13346

2029

14060

(Total for Question 18 is 3 marks)

19 A circle C has the equation $x^2 + y^2 = r^2$

The point A with coordinates $(6,8)$ lies on C .

(a) Work out the length of the diameter of C

$$\begin{aligned} 6^2 + 8^2 &= r^2 \\ 36 + 64 &= r^2 \\ 100 &= r^2 \\ 10 &= r \\ 20 &= D \end{aligned}$$

20

(3)

(b) The tangent to circle C passes through the point $(6,8)$.

Work out the equation of the tangent.

$$\frac{8-0}{6-0} = \frac{8}{6} = \frac{4}{3}$$

$$y = -\frac{3}{4}x + c$$

$$8 = -\frac{3}{4} \times 6 + c$$

$$8 = -\frac{18}{4} + c$$

$$12.5 = c$$

$$y = -\frac{3}{4}x + 12.5$$

(4)

(Total for Question 19 is 7 marks)

20 Solve

$$y + 5 = 2x$$

$$x^2 = 2y + 31$$

$$y = 2x - 5$$

You **must** show your working.

$$x^2 = 2(2x - 5) + 31$$

$$x^2 = 4x - 10 + 31$$

$$x^2 = 4x + 21$$

$$x^2 - 4x - 21 = 0$$

$$(x - 7)(x + 3) = 0$$

$$x = 7 \quad x = -3$$

$$y = 2(7) - 5 = 9$$

$$y = 2(-3) - 5 = -11$$

$$x = \underline{7}$$

$$y = \underline{9}$$

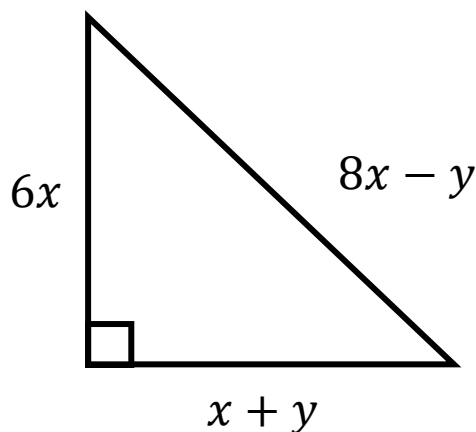
$$\text{or } x = \underline{-3}$$

$$y = \underline{-11}$$

(Total for Question 20 is 5 marks)

21

The diagram shows a right-angled triangle



Prove algebraically that $x:y = 2:3$

$$(6x)^2 + (x+y)^2 = (8x-y)^2$$

$$36x^2 + x^2 + 2xy + y^2 = 64x^2 - 16xy + y^2$$

$$18xy = 27x^2$$

$$18y = 27x$$

$$\frac{y}{27} = \frac{x}{18}$$

$$\begin{array}{l} x:y \\ 18:27 \\ 2:3 \end{array}$$

(Total for Question 21 is 6 marks)

22 Show that the expression below can be written in the form ax^b where a and b are integers

$$\frac{(16x^4)^{\frac{3}{2}} \times (2x)^{-2}}{4x^{-2}}$$

$$(\sqrt{16x^4})^3 = 64x^6$$

$$(2x)^{-2} = \frac{1}{4x^2}$$

$$64x^6 \times \frac{1}{4x^2} = \frac{64x^6}{4x^2} = 16x^4$$

$$\frac{16x^4}{4x^{-2}} = 4x^6$$

(Total for Question 22 is 4 marks)

Total for this paper is 80 marks