TRIAL PAPER 1
NO CALCULATORS

WRITE YOUR ANSWERS, **INCLUDING ROUGH WORKING**, ON THESE SHEETS

1. a) Calculate 40% of £720.

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b) Orange makes up $\frac{2}{5}$ of a drink. How much orange is there in 470 ml of the drink?

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2. Bob has £2500. He uses $\frac{1}{5}$ of the £2500 to buy a hi–fi. He puts $\frac{1}{4}$ of the amount he has left after buying the hi–fi into a bank.

a) How much money remains after the above amounts have been taken away?

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b) What fraction of the £2500 remains after the above amounts have been taken away?

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3. a) Showing your working, obtain an ESTIMATE for the value of $\frac{512 \times 33}{43}$.

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b) A model of a car is built to a scale of 1 : 30.

i) The height of the real car is 180 cm. How high is the model car?

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ii) The length of the model car is 11 cm. How long is the real car?

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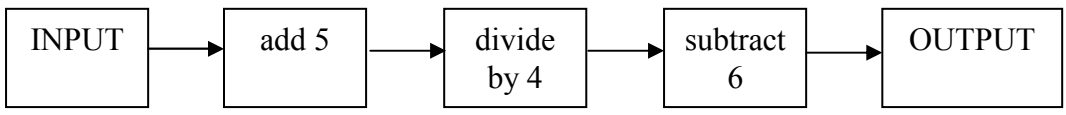
4.



Use the above instructions to complete the following table.

INPUT	OUTPUT
23	1
20	
−1	
	6

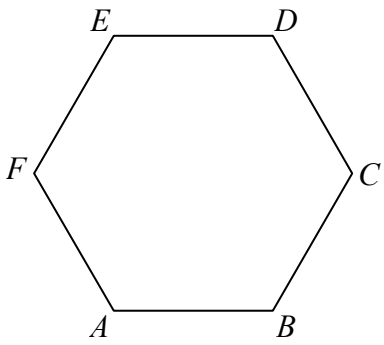
5. a) Concert tickets, for a part of a theatre known as the stalls, cost £x each. What, in terms of x, is the cost of 6 tickets for the stalls?

b) A ticket for another part of the theatre known as the circle costs £3 less than a ticket for the stalls. What, in terms of x, is the cost of one ticket for the circle?

c) What, in terms of x, is the cost of 5 tickets for the circle?

d) Find, in terms of x, the total cost of 6 tickets for the stalls and 5 tickets for the circle, simplifying your answer as far as possible.

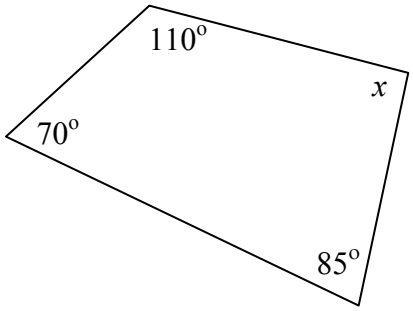
6. The following shows a regular hexagon, *ABCDEF*.
Point *B* is due east of *A* and due south of *D*,

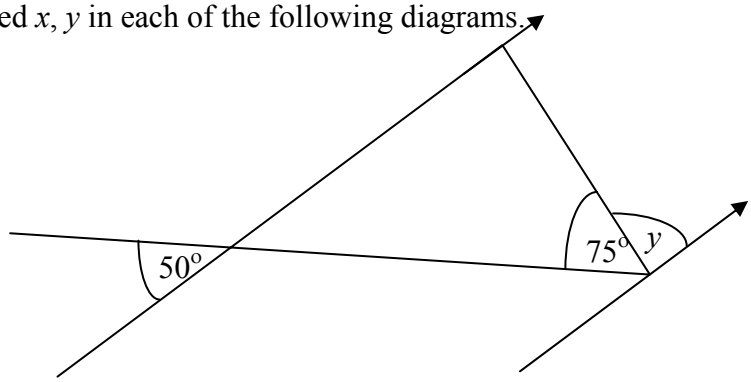


i) What is the bearing of *C* from *B* ?

ii) What is the bearing of *E* from *C*.

7. Write down the size of the angles marked x, y in each of the following diagrams.

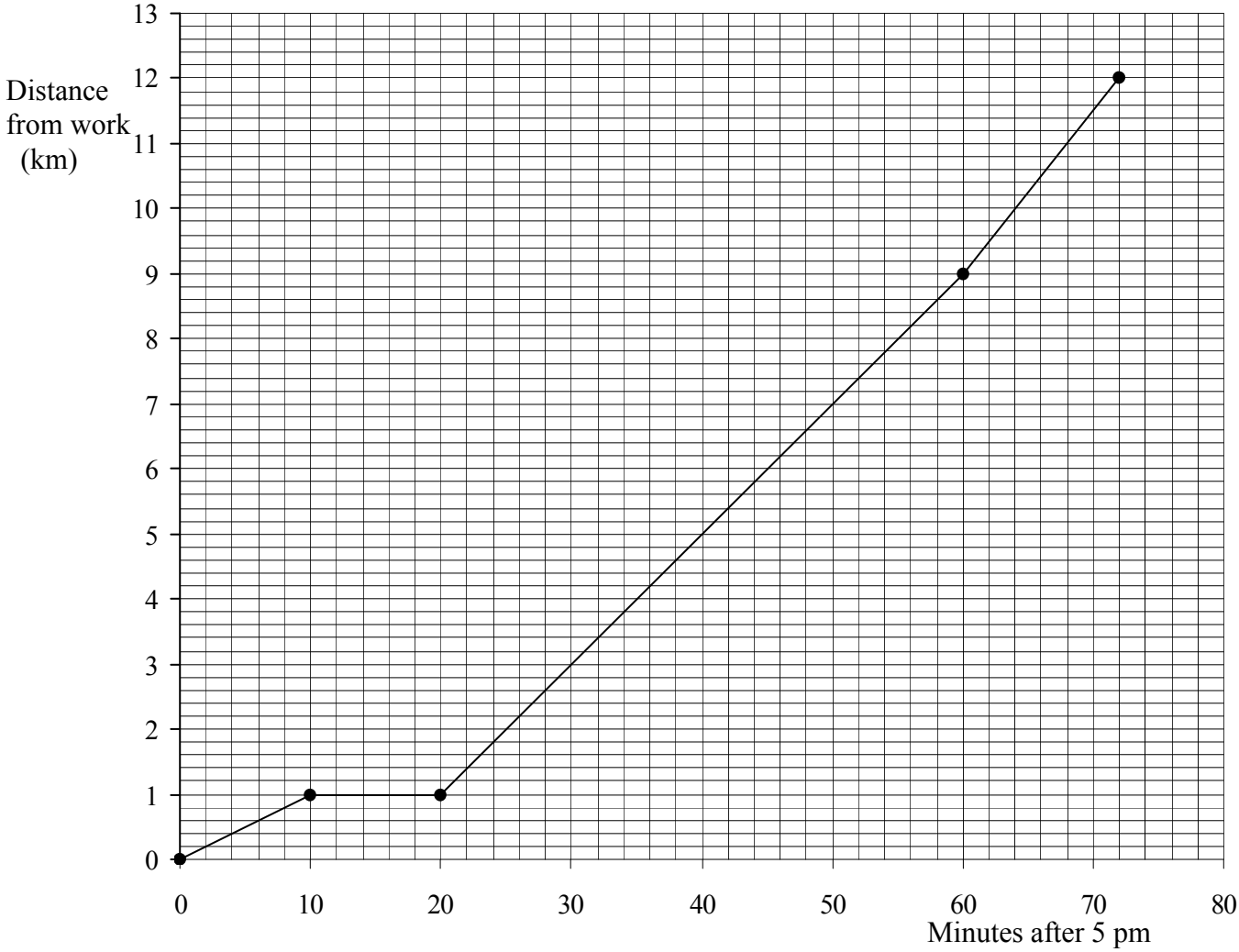




x = ...

y = ...

8. Matthew leaves work at 5 pm and travels the 12 km home. The graph below shows the different stages of his journey.



a) The first part of Matthew's journey involved walking to a bus stop. How fast did Matthew walk?

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The remainder of the journey involved a bus journey followed by Matthew cycling to his house.

b) How far was the bus journey? ……..

c) What was the average speed of the bus? ..…….

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d) At what time did Matthew arrive home? ……...

e) At 5.20 pm, Matthew's sister, Sarah, left home and cycled towards Matthew's place of work at an average speed of 10 km/h. Draw the graph of Sarah's journey on the graph above.

f) At what time did Sarah and Matthew pass each other? …….

9. a) Seven hundred pounds is invested at 6% per annum simple interest for three years. Calculate the amount invested after 3 years.

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b) Share £240 in the ratio 3 : 5.

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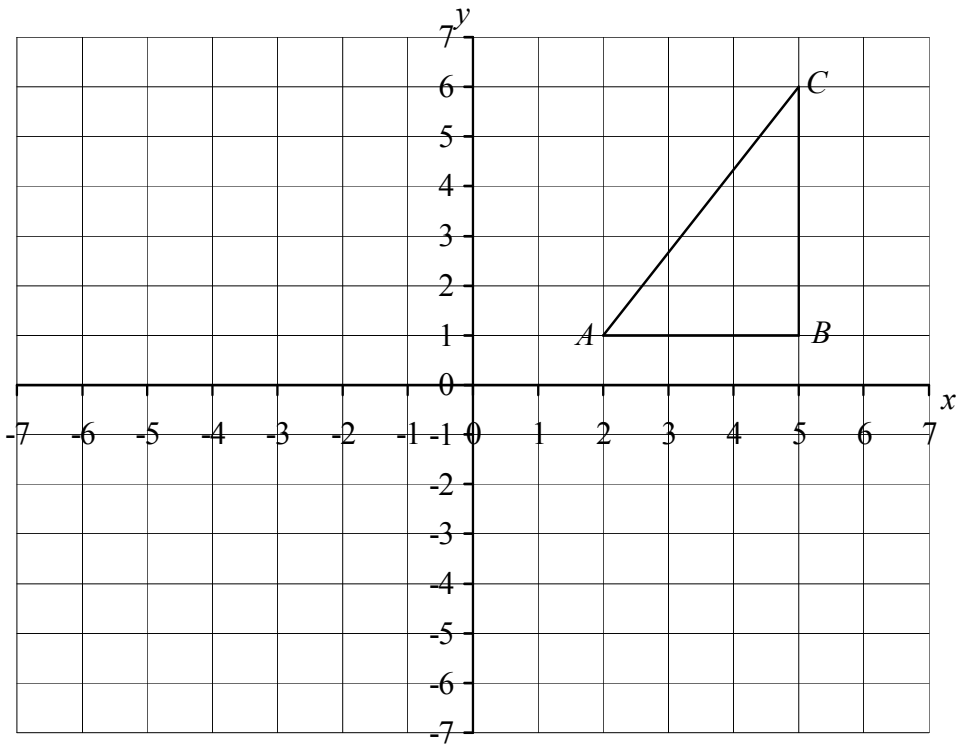
10.



a) Reflect triangle *ABC* in the *x*–axis. Label the new triangle *LMN*.
b) Rotate triangle *LMN* 90° clockwise about the origin (0, 0). Label the new triangle *PQR*.
c) Which single transformation maps triangle *ABC* onto triangle *PQR*?

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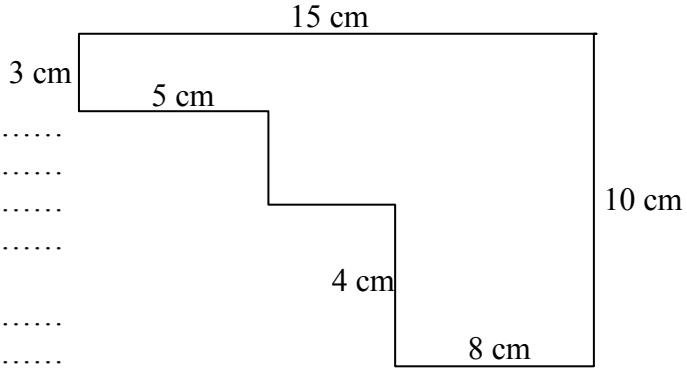
11. Clearly indicating the units, calculate



a) the perimeter of the above figure

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b) the area of the above figure.

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12. In a certain rectangle the length of each of the shorter sides is 4 cm less than the length of each of the longer sides. Let x cm denote the length of each of the longer sides.

a) Write down, in terms of x, the length of each of the shorter sides.

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b) Write down, in terms of x, the perimeter of the rectangle. Simplify your answer as far as possible.

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c) The perimeter of the rectangle is 30 cm. Write down an equation in x. Solve this equation to find the value of x.

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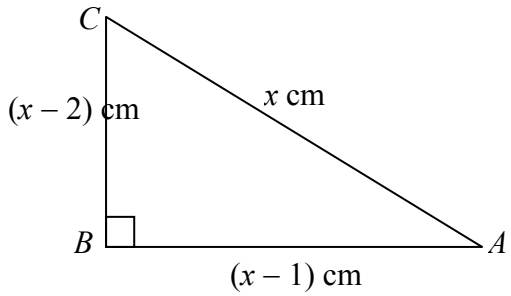
13.



ABC is a triangle with a right angle at B.
The length of its three sides are x cm, $(x - 1)$ cm and $(x - 2)$ cm.

a) Show that x satisfies the equation $x^2 - 6x + 5 = 0$.

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b) Solve the equation $x^2 - 6x + 5 = 0$.

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c) Use your solutions in b) to write down the lengths of the sides of the triangle.

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14. a) Simplify $(6c^2.d^2) \times (5c^4.d^2)$.

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b) Factorise $5x^2 - 25x$.

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15. A biologist measures the heights of 100 shrubs to the nearest cm. The following table shows her results.

Height (to nearest cm)	1 to 5	6 to 10	11 to 15	16 to 20	21 to 30
Frequency	25	31	18	15	11

a) Calculate an estimate of the mean height of the trees in the sample.

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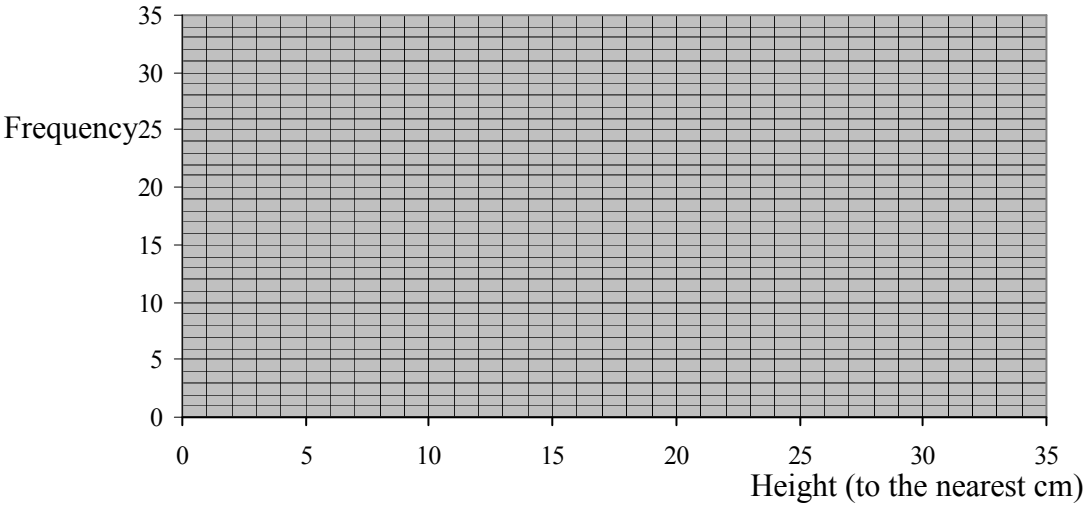
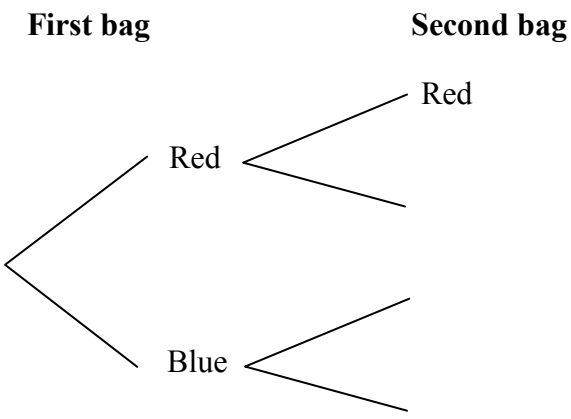
b) Draw a frequency polygon to show the biologist's results.



16. a) A bag contains 4 red balls and 6 blue balls. Another bag contains 3 red and 5 blue balls. John takes one ball from each bag without looking. Complete this tree diagram to show the possible outcomes and their probabilities.



b) What is the probability that John takes

i) two reds,

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ii) exactly one red?

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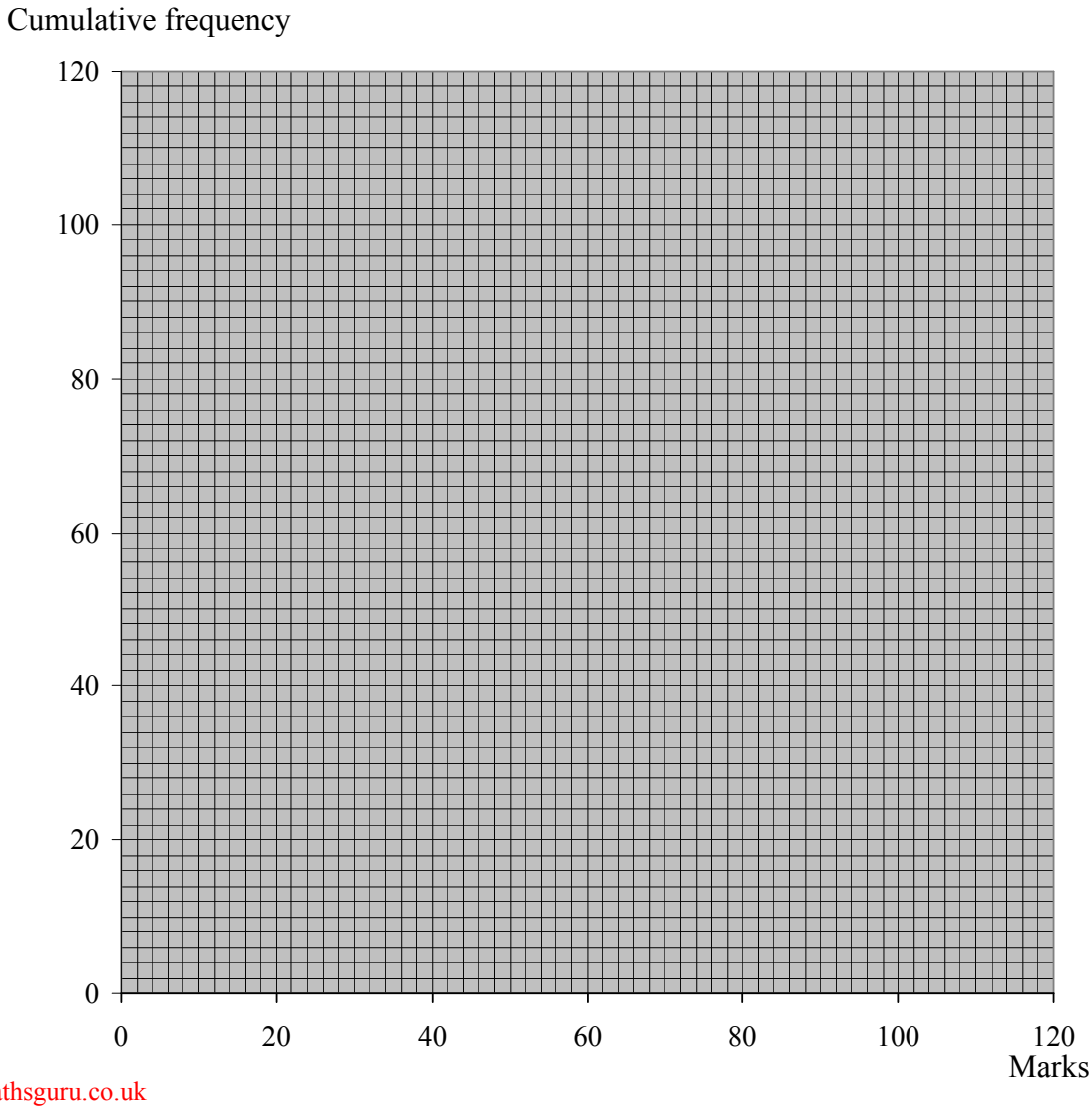
17. The following table shows the scores obtained by 120 students in a Physics test.

Mark	20 to 39	40 to 59	60 to 69	70 to 79	80 to 89	90 to 99
Frequency	6	28	31	22	20	13

a) Complete the table below to show the cumulative frequencies for these results.

Mark	40	60	70	80	90	100
Cumulative Frequency						

b) Draw a cumulative frequency diagram to show these results.



c) Complete this table to show the median and inter-quartile range for this distribution.

Median	Lower Quartile	Upper Quartile	Inter-Quartile Range

d) The top 80% of students passed the test. What was the pass mark?

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Answers.

1. a) £288 b) 188 ml.
2. a) £1500 b) $\frac{3}{5}$.
3. a) 375 b) i) 6 cm ii) 330 cm.
4.

INPUT	OUTPUT
23	1
20	**0·25**
–1	**–5**
43	6

5. a) $6x$ b) $(x - 3)$ c) $5(x - 3)$ or $5x - 15$ d) $11x - 15$.
6. i) 30^{o} ii) 300^{-o}.
7. $x = 95^{o}$, $y = 55^{o}$.
8. a) 6 km/h b) 8 km c) 12 km/h d) 6.12 pm
   f) 5.50 pm.
9. a) £826 b) £90 : £150.
10. c) A reflection in the line $y = -x$·
11. a) 50 cm b) 107 cm^2.
12. a) $x - 4$ b) $4x - 8$ c) $4x - 8 = 30$, $x = 9{\cdot}5$.
13. c) 5 cm, 4 cm, 3 cm.
14. a) $30c^6d^4$, b) $5x(x - 5)$.
15. a) 11·02 cm.
16. b) i) $\frac{3}{20}$ ii) $\frac{19}{40}$.
17. a)

Mark	40	60	70	80	90	100
Cumulative Frequency	6	34	65	87	107	120

c)

Median	Lower Quartile	Upper Quartile	Inter-Quartile Range
68	57	82	25

d) 53%.