1. Use the fact that $28 \times 49 = 1372$ to write down the answers to the following.

    (a) $2{\cdot}8 \times 4{\cdot}9 =$

    [1]

    (b) $14 \times 490 =$

    [1]

    (c) $137{\cdot}2 \div 49 =$

    [1]

2. Find the value of

    (a) $5^3 \times 2^3$,

    [2]

    (b) $28{\cdot}6 - 12{\cdot}73$.

    [1]

3. Toby travels to work by train. He buys either a £5 return ticket or a £3 single ticket.

Over the past few months he bought x return tickets.

(a) Write down, in terms of x, the total cost (in pounds) of these return tickets.

....

[1]

(b) The number of single tickets he bought was 9 more than the number of return tickets he bought. Write down, in terms of x, how many single tickets Toby bought.

....

[1]

(c) Write down, in terms of x, the total cost (in pounds) of these single tickets.

....

[1]

(d) Write down, in terms of x, the total cost (in pounds) of all the tickets Toby has bought. You must simplify your answer as far as possible.

....

....

....

....

....

[3]

4. Write down the following numbers correct to 2 significant figures.

(a) 0·063732

....

[1]

(b) 7934

....

[1]

5. In a game, a player throws two fair dice, one coloured red the other blue.
The score for the throw is the smaller of the two numbers showing. For example:
if the red dice shows 5 and the blue dice shows 2, the score for the throw is 2;
if the red dice shows 3 and the blue dice shows 3, the score for the throw is 3.

(a) Complete the following table to show all the possible scores.

Red dice	Blue dice					
6	1	2	3	....	....	....
5	1	2	3	....	....	....
4	1	2	3	....	....	....
3	1	2	3	3	....	....
2	1	2	2	2	....	....
1	1	1	1	1	1	1
	1	2	3	4	5	6

Blue dice

[2]

(b) (i) What is the probability that a player scores 1?

....

[2]

(ii) What is the probability that a player scores more than 1?

....

[1]

A player wins a prize by getting a score of 2 or less.

(c) William plays the game once. What is the probability that he wins a prize?

....

....

[1]

(d) (i) 360 people each play the game once.
Approximately how many would you expect to win a prize?

[2]

(ii) It costs £1 to play the game once. The prize for winning is £1.50. If the 360 people each play the game once, approximately how much profit do you expect the game to make?

[2]

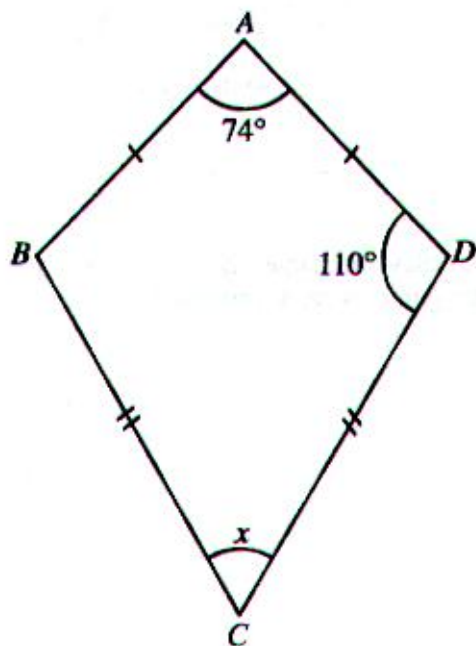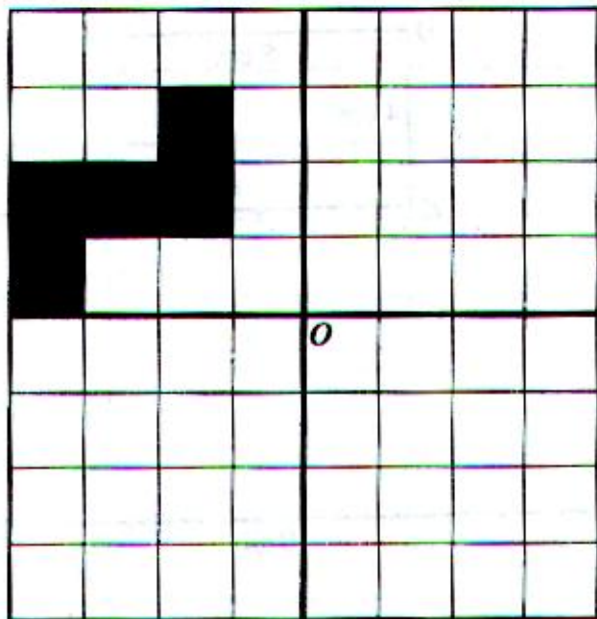**6.** *ABCD* is a kite. Calculate the size of the angle marked *x*.

Diagram not drawn to scale.

....

....

....

....

$x =$ ....$^{\circ}$

[3]

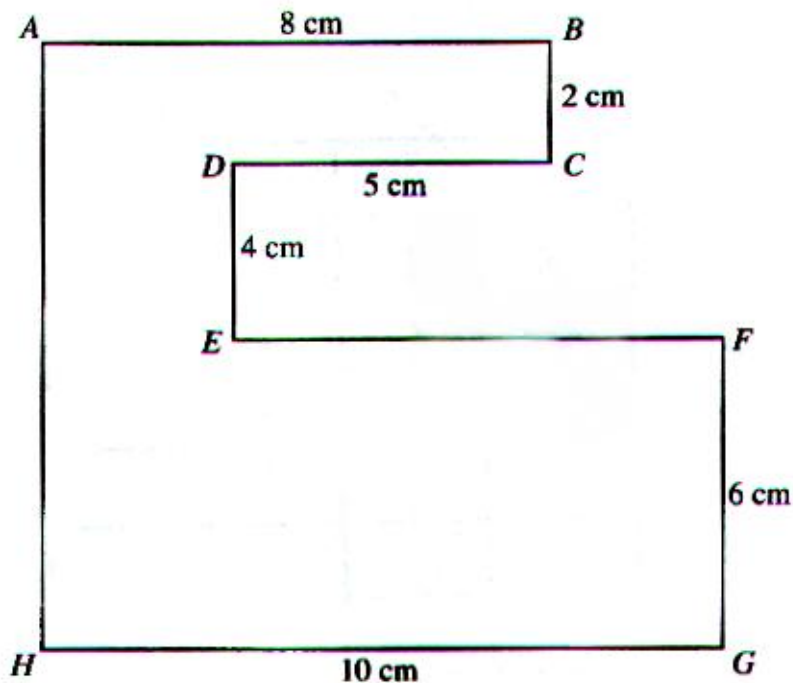7. Draw three shapes like the given one, so that the completed pattern has rotational symmetry of order 4 about O. [3]

8.

Diagram not drawn to scale.

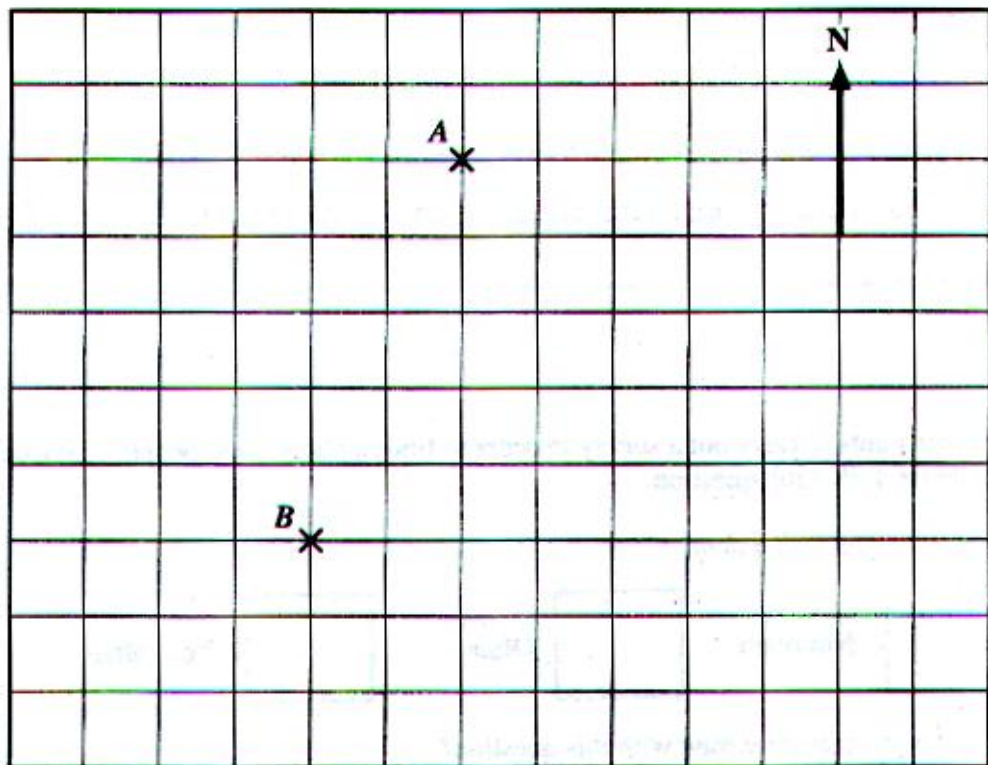(a) Calculate the perimeter of the shape *ABCDEFGH* stating clearly the units of your answer.

....

....

....

....

[2]

(b) Calculate the area of the shape *ABCDEFGH* stating clearly the units of your answer.

....

....

....

....

[3]

9. (a) A and B represent the position of 2 towns on a grid. Write down the bearing of B from A.

_____

[2]

(b) Another town, C, is due East of B and on a bearing of 150° (S30°E) from A. Plot, as accurately as you can, the position of this town. [2]

10. A shopkeeper buys video recorders at £160 each. At what price must the shopkeeper sell the video recorders in order to make a profit of 30%?

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....

....

[3]

11. Mr. Young wants to carry out a survey in order to find out how often people visit a dentist. He wrote the following question.

How often do you visit a dentist?

☐ Not often   ☐ Often   ☐ Very often

(i) What do you see wrong with this question?

....

....

[1]

(ii) Write a better version of the question.

....

....

....

....

[2]

12. Given that $h = \dfrac{12(a-17)}{m}$, find the value of h when $a = 9$ and $m = -4$.

[3]

13. *(a)* Express 700 as a product of prime numbers in index form.

[3]

(b) Use your result in part *(a)* to write down the smallest multiple of 700 which is a perfect square.
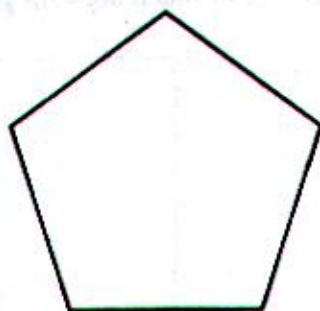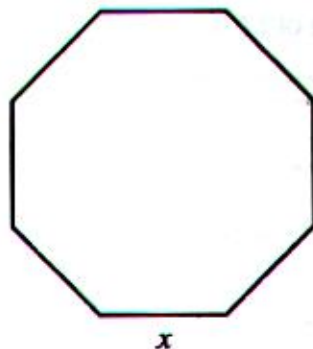
[1]

14. Solve the following equations.

(a) $5x + 8 = 36 - 2x$

[3]

(b) $16x - 5 = 3(4x + 7)$

[3]

15.

The sides of a regular octagon are x cm long. Each side of a regular pentagon is 6 cm longer than each side of the octagon. The perimeter of the octagon is 3 cm longer than the perimeter of the pentagon.

(a)   Write down an equation that x satisfies.

_____

_____

_____

[2]

(b)   Solve the equation and hence find the length of a side of the pentagon.

_____

_____

_____

_____

[3]

16. Jill and Alan invest some money and share any profit made in the ratio of 5:4.

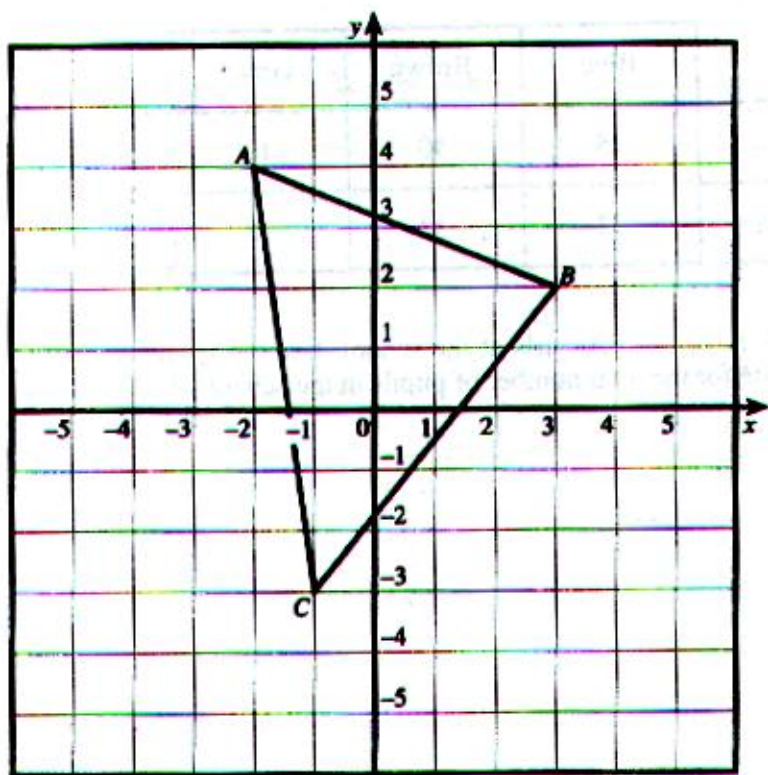(a) How much does Jill get when they make a profit of £270?

[2]

(b) On another occasion, Alan received £136. How much profit were they sharing?
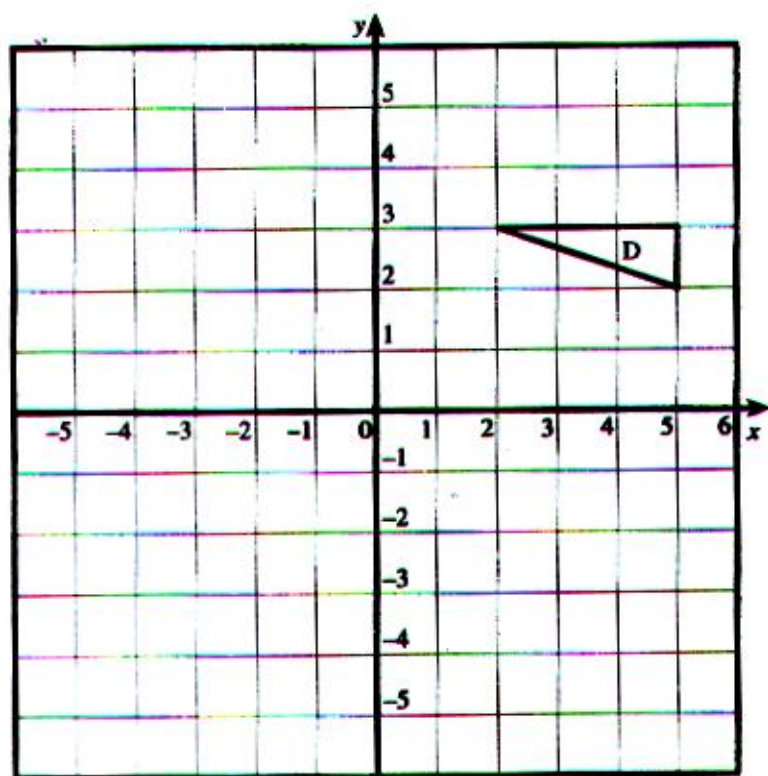
[2]

17. *(a)* Draw the image when the triangle *ABC* is reflected in the line $y = -x$. [2]

(b) Draw the image when the triangle marked D is rotated through 90° anticlockwise about the point $(1, -1)$. [2]

18. A sample of boys and girls at a school yielded the following results for their eye colour.

	Blue	Brown	Green	Other	Total
Boys	28	40	10	22	100
Girls	32	30	8	10	80

There are 930 boys and 720 girls at the school. Use the results of the sample and these totals to find an estimate for the total number of pupils in the school with brown eyes.

....

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....

....

....

....

[4]

19. Solve the following simultaneous equations by an algebraic (not graphical) method. Show all your working.

$$3x - 4y = 22$$
$$2x + 3y = -8$$

[4]

20. Factorise

(a) $3xy^2 - 6xy$,

[2]

(b) $x^2 + 2x - 8$.

[2]

21. The times taken by 160 pupils to travel to school were measured and the results are summarised in the following table.

Time taken (to the nearest minute)	1-10	11-20	21-30	31-40	41-50	51-60	61-70
Number of pupils	12	56	44	20	16	8	4

(a) Complete the following cumulative frequency table.

Time taken (less than)	10·5	20·5	30·5	40·5	50·5	60·5	70·5
Cumulative frequency							

[1]

(b) On the graph paper opposite, draw a cumulative frequency diagram to show this information. [3]

(c) Use your cumulative frequency diagram to find the interquartile range.

....

....

....

....

[2]

(d) Use your cumulative frequency diagram to complete the following statement.

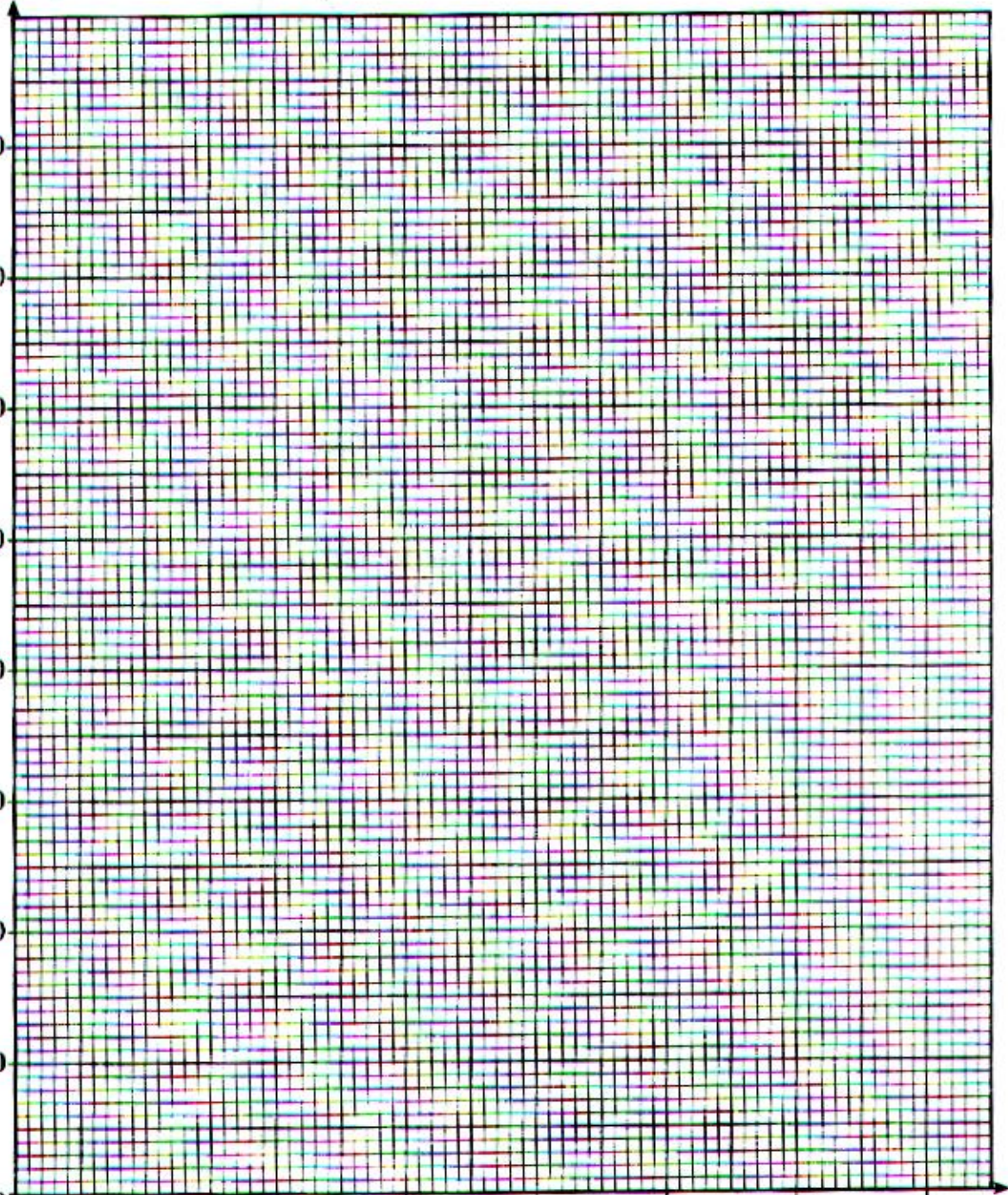60% of the pupils took less than .... minutes to travel to school. [1]
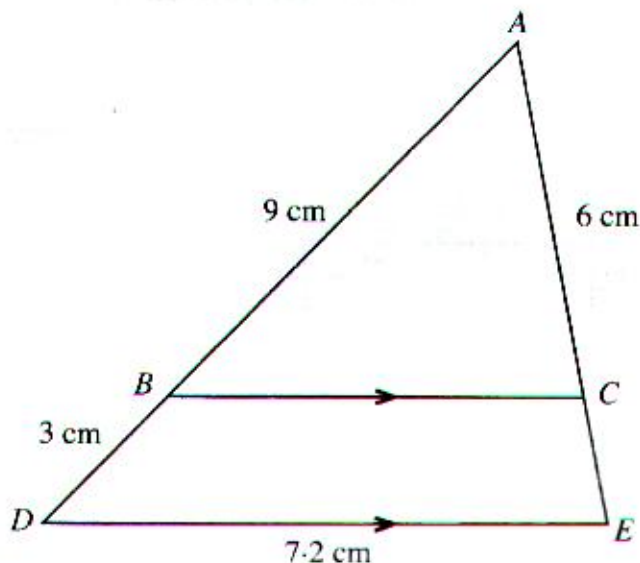
22.

Diagram not drawn to scale.

In the diagram, *BC* is parallel to *DE*, and the triangles *ABC* and *ADE* are similar.
$AB = 9$ cm, $AC = 6$ cm, $BD = 3$ cm and $DE = 7·2$ cm.

Showing all your working, find the length of

(a)   *BC*,

....

....

....

....

[2]

(b)   *AE*.

....

....

....

....

[2]

23. In each of the following formulae, every letter stands for the measurement of a length. By considering the dimensions implied by each formula, write down, for each case, whether the formula could be for a length, an area, a volume or none of these.

The first one has been done for you.

Formula could be for

$4d^2 + 2dh$ area

$10r^3 + 5hr^2$ ....

$4h + 2d - 8h$ ....

$(r^2 - 7hd)h$ ....

$r^2 + 8dh + 3hr$ ....

[2]

24. (a) Rearrange the inequality $35 - 3n > 2n + 7$ into the form $n <$ *some number.*

....

....

....

....

[2]

(b) Given that n also satisfies the inequality $3n > 1$, write down all the integer values of n that satisfy both inequalities.

....

....

....

....

....

[2]