Revision exercise A1

Use your calculator for questions **1** to **4**. Where necessary, give your answer to 3 decimal places.

1 Work out these.

a) $^{-}2{\cdot}3 \times {}^{-}4{\cdot}6 + {}^{-}3{\cdot}9 \times 2{\cdot}1$

b) $4{\cdot}2 + 6{\cdot}3 - 8{\cdot}4 - 7{\cdot}9 + 1{\cdot}3 + 3{\cdot}1 - 5{\cdot}2 - 6{\cdot}3$

c) $\dfrac{{}^{-}3{\cdot}2 \times 2{\cdot}3 + 7{\cdot}9 \times {}^{-}2{\cdot}4}{{}^{-}8{\cdot}4}$

2 Work out these.

a) $^{-}2{\cdot}73 + 12{\cdot}6 - 11{\cdot}91 + 13{\cdot}2$

b) $^{-}4{\cdot}5 \times 8{\cdot}3 + 6{\cdot}1 \times {}^{-}4{\cdot}3$

c) $\dfrac{{}^{-}4{\cdot}7 + 3{\cdot}6}{{}^{-}7{\cdot}5}$

3 Work out these.

a) 3^4

b) 4^4

c) $12{\cdot}3^3 - 2{\cdot}6^3$

4 Work out these.

a) $\sqrt{5^2 + 8^2}$

b) $\dfrac{7{\cdot}92 \times 1{\cdot}71}{4{\cdot}2 + 3{\cdot}6}$

c) $(4{\cdot}1 - 3 \times 2{\cdot}6)^3$

5 Find the reciprocal of each of these numbers.

a) 5 **b)** $\frac{4}{5}$ **c)** $2\frac{1}{4}$ **d)** 0·4

6 Calculate the length of a side of a square which has an area of 70 cm^2.
Give your answer to a sensible degree of accuracy.

7 Expand these brackets.

a) $4(a - 3)$ **b)** $5(3 + x)$

c) $7(a + 2)$ **d)** $3(3 + 2x)$

e) $5(9x + 7)$

8 Factorise these fully.

a) $12a - 6$ **b)** $15x^2 - x$

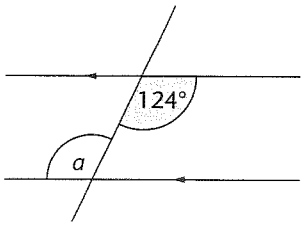
c) $4a^2 + a$ **d)** $a^2 + 4a$

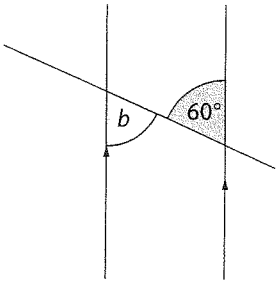
e) $3y - 7y^2$

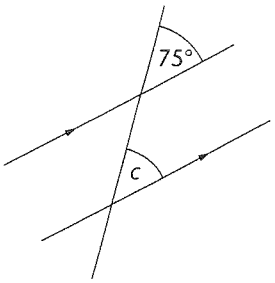
9 An isosceles triangle has an angle of 30°.
Find the size of each of the other angles in the triangle.
There are two possible sets of answers.
Find both sets.

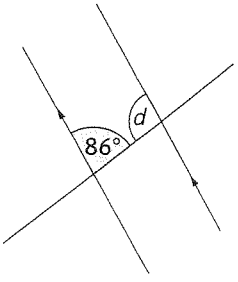
10 Three angles of a quadrilateral are 67°, 122° and 94°.
Find the size of the other angle.

11 Find the size of each of the lettered angles, giving your reasons.









12 Four of the exterior angles of a pentagon are 84°, 67°, 55° and 96°.
Find the size of the other exterior angle.

13 In a game of badminton one player must win. A draw is not possible.
Graeme plays Chris in three games of badminton.
The probability that Graeme wins all three games is $\frac{1}{8}$.
What is the probability that Chris wins at least one game?

14 There are green, black and white balls in a bag. One ball is selected at random. The outcomes are denoted by G, B and W.

P(G) = 0·43 and P(B) = 0·28. Find P(W).

15 Melanie is choosing one main course from a choice of three on the canteen menu.

MENU
Sausage and Chips
Ham Salad
Vegetable Lasagne

The probability that she chooses sausage and chips is 0·1.
The probability that she chooses ham salad is 0·6.
What is the probability that she chooses vegetable lasagne?

16 Draw axes from 0 to 8 for both x and y.

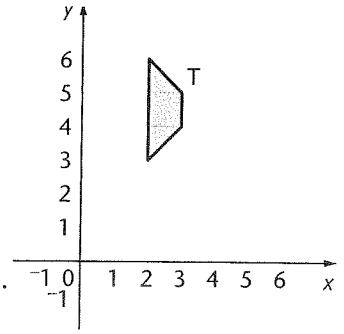
a) Plot the points (1, 5), (2, 5) and (3, 8). Join them to make a triangle and label it A.

b) Plot the points (4, 1), (5, 1) and (6, 4). Join them to make a triangle and label it B.

c) Describe fully the transformation that maps triangle A on to triangle B.

17 **a)** Copy the diagram.

Translate the trapezium T by $\begin{pmatrix} 3 \\ -4 \end{pmatrix}$.
Label the image A.



b) Describe fully the transformation that maps trapezium A on to trapezium T.

Revision exercise B1

1 Write these fractions in order, smallest first.

$\frac{7}{20}$ $\frac{3}{4}$ $\frac{17}{20}$ $\frac{4}{5}$

2 Work out these.

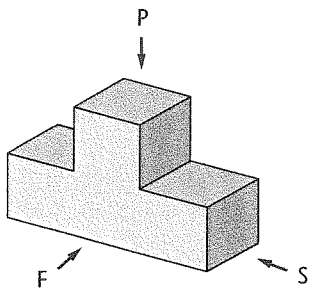
a) $\frac{1}{2} + \frac{1}{4}$ **b)** $\frac{5}{8} + \frac{3}{4}$

c) $\frac{5}{8} - \frac{1}{4}$ **d)** $1\frac{5}{8} + 2\frac{1}{4}$

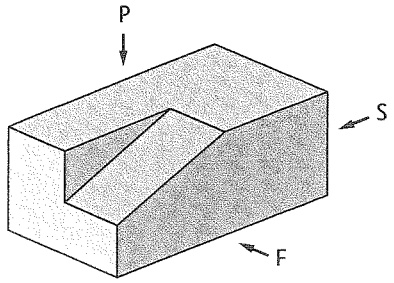
e) $2\frac{5}{8} - \frac{3}{5}$

3 Sketch the plan and elevations of these solid shapes.
The arrows indicate the direction of the plan, P, the front elevation, F, and the side elevation, S.

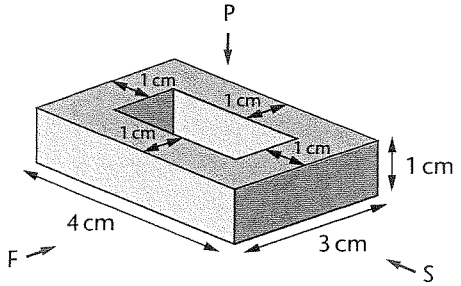
a)



b)



4 Draw accurately the plan and elevations of this solid shape.



5 Write each of these ratios in its simplest form.

a) 9 : 2 **b)** 25 : 5

c) 60 : 40 **d)** 39 : 13

e) 60 : 144

6 Write each of these ratios in its simplest form.

a) 70 cl : 1 litre

b) £2 : 80p

c) 9 hours : $1\frac{1}{2}$ hours

d) 9 kg : 150 g

7 A shade of orange paint is made by mixing red paint and yellow paint in the ratio 1 : 3.

a) How many tins of yellow paint would you mix with four tins of red?

b) How many tins of red paint would you mix with eighteen tins of yellow?

8 The instructions for making flaky pastry say, 'First mix flour and fat in the ratio 8 parts to 5 parts.'
How much fat should I mix with 480 g of flour?

9 Laura and Marie share a flat. They agree to share the rent in the same ratio as their wages.
Laura earns £600 per month and Marie earns £800 per month.
The rent is £420 per month.
How much do they each pay?

10 Solve these equations.

a) $2(2x - 1) = 3(x - 2)$

b) $3(5x + 2) = 7(2x + 1)$

c) $4x + 7 = 3(4 + x)$

d) $5(2x - 3) = 15$

e) $3(3x - 2) = 2(2x - 3)$

11 Solve these equations.

a) $5 + x = 3x - 7$

b) $3 - x = 2x - 3$

c) $2(3x - 2) = 4(2x + 3) - x$

d) $3(7 - x) = 4(1 - 2x)$

e) $3(x + 1) = 12 - x$

12 Simplify these, writing your answer in index form.

a) $3 \times 3 \times 3 \times 3 \times 3 \times 3 \times 3$

b) $6 \times 6 \times 7 \times 7 \times 6$

c) $a \times a \times a \times a \times a$

13 Find the value of these expressions when $x = -3$.

a) $2x^2$ **b)** $3x^3$

14 Find the value of $3b^2 - 2a^3$ when $a = -2$ and $b = 3$.

15 Draw a circle. On your circle

a) draw and label a chord.

b) draw and label a tangent.

c) shade and label a segment.

16 Find the circumference of a circle with

a) a diameter of 6 cm.

b) a radius of 10 cm.

c) a diameter of 4 cm.

17 Find the area of a circle with

a) a diameter of 4 cm.

b) a radius of 3 cm.

c) a radius of 12 cm.

18 Find the diameter of a circle with a circumference of 30 m.
Give your answer correct to 1 decimal place.

Revision exercise C1

Do not use your calculator for this exercise.

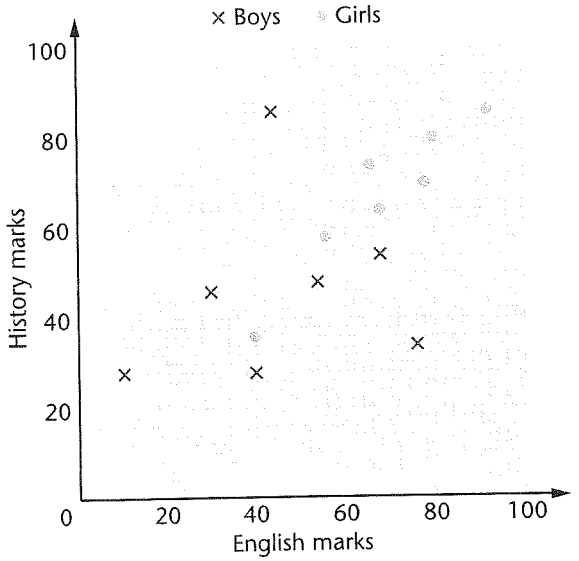
1 The heights, (in centimetres), and weights (in kilograms) of 20 members of a rugby club are given in the table.

Height	Weight
174	85
182	94
184	89
181	93
179	94
178	92
186	98
188	96
192	102
189	94
178	99
183	97
185	98
186	94
189	89
187	102
179	91
194	96
184	94
181	98

a) What is the weight of the tallest player?
b) Draw a scatter diagram to show these data.
c) Draw a line of best fit.
d) Estimate the weight of a player who is 1·98 m tall.

2 Nina thinks that the more she trains, the less time it will take to swim a length. State the type of correlation of which this is an example.

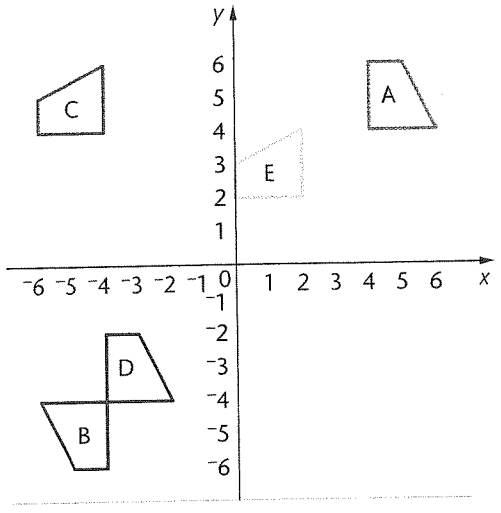
3 The scatter diagram shows the English and history test scores of 7 boys and 7 girls. Compare the performance of the boys and the girls.



4 **a)** On a grid labelled $^{-}4$ to 4 on both axes, plot the points (1, 1), (1, 3) and (2, 3) and join them to make a triangle. Label it T.
b) Rotate triangle T through a half-turn about the origin.

5 **a)** On another grid, draw the triangle in question **4** again.
b) Rotate triangle T through 90° anticlockwise about the point ($^{-}1$, 1).

6 Describe fully the transformation that maps
a) A on to B. **b)** A on to C.
c) B on to D. **d)** A on to E.



7 **a)** $\frac{2}{3} \times \frac{3}{5}$ **b)** $\frac{3}{14} \times \frac{7}{9}$
c) $\frac{5}{8} \times \frac{6}{35}$ **d)** $\frac{3}{4} \div \frac{1}{4}$
e) $\frac{7}{8} \div \frac{5}{12}$ **f)** $\frac{9}{10} \div \frac{7}{15}$

8 **a)** £4·64 + £5·92 **b)** £16·34 + £8·26
c) £5·96 – £1·48 **d)** £24·33 – £13·74

9 **a)** 2·46 + 1·70 **b)** 19·83 + 16·42
c) 36·95 – 14·43 **d)** 134·2 – 99·9

10 **a)** 8 × 7·6 **b)** 7 × 4·9
c) 3 × 0·04 **d)** 8 × 0·9
e) 5000 × 2·4 **f)** 6·99 × 400
g) 1·88 × 3000 **h)** $(0{\cdot}3)^2$

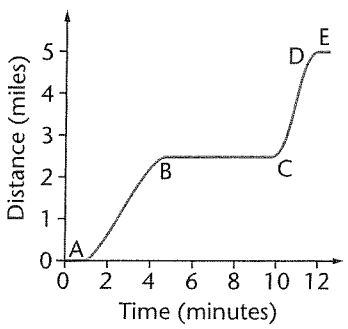
11 **a)** 60·5 ÷ 5 **b)** 330·3 ÷ 3
c) 3·244 ÷ 4 **d)** 85·5 ÷ 5
e) 4 ÷ 0·8 **f)** 3·2 ÷ 0·4
g) 3·9 ÷ 0·6 **h)** 5 ÷ 0·25

12 Draw a set of x- and y-axes, both labelled from $^-6$ to 6.
Draw the lines $x = 3$, $x = {}^-5$, $y = {}^-3$ and $y = 4$.

13 Draw a set of axes, labelling the x-axis from $^-3$ to 3 and the y-axis from $^-10$ to 12.
a) Draw the graph of $y = 3x$, for $x = {}^-3$ to 3.
b) On the same grid, draw the graph of $y = {}^-2x + 5$.
c) Write down the coordinates of the point where the two lines cross.

14 **a)** Draw the graph of $y = 2x - 4$, for $x = {}^-2$ to 5.
b) On the same grid, draw the graph of $5y + 2x = 10$.
c) Write down the coordinates of the point where the two lines cross.

15 The distance travelled by a train between two stations is shown on this graph.



a) How far is it between stations?
b) What was happening on section BC of the graph?
c) What was happening on section DE of the graph?
d) On which section did the train travel at the greatest speed?

16 A kite was launched and gained height, slowly at first but then more quickly, until it was 30 m up after about 10 seconds. It flew at this height for 30 seconds, then came down 20 m very quickly. It descended the remaining 10 m more gently, landing 50 seconds after it started. Draw a graph to show this.

17 'Beevis' car rental have three rates for the daily hire of their cars. For all three rates customers have to buy the petrol they use.

Rate A: 25p per mile
Rate B: £10 fixed charge plus 15p per mile
Rate C: £30 but with no mileage charge

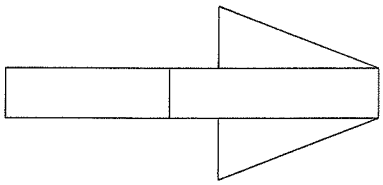
a) Find the cost of hiring a car at rate A to travel these distances.
(i) 0 miles
(ii) 30 miles
(iii) 100 miles
b) Find the cost of hiring a car at rate B to travel these distances.
(i) 0 miles
(ii) 30 miles
(iii) 100 miles
c) Find the cost of hiring a car at rate C to travel these distances.
(i) 0 miles
(ii) 30 miles
(iii) 100 miles
d) On the same axes, draw three graphs to show the cost of hiring a car at the three different rates.
Use a scale of 20 miles for 2 cm on the x-axis and £10 for 2 cm on the y-axis.
e) Which is the cheapest rate to travel each of these distances?
(i) 60 miles
(ii) 120 miles
(iii) 140 miles

Revision exercise D1

1 **a)** Use a ruler, protractor and compasses to construct triangle ABC where AB = 5 cm, angle A = 52° and BC = 7 cm.

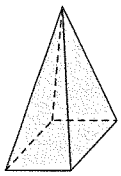
b) Measure angle C.

2 Here is the net of a solid.

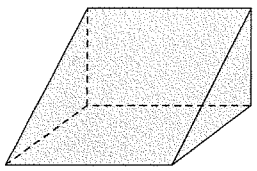


Which one of these solids could it be?

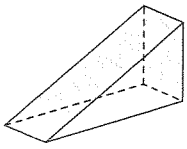
a)



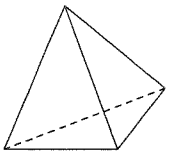
b)



c)

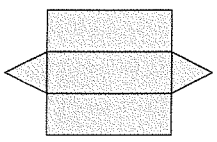


d)

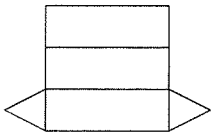


3 Which of these sketches could be the net of a triangular prism?

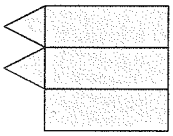
a)



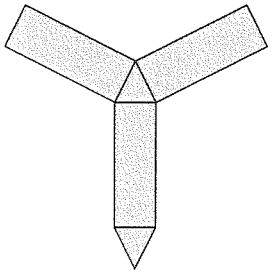
b)



c)

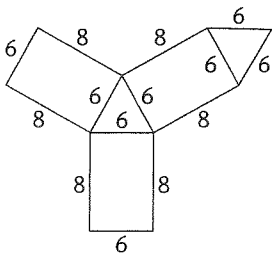


d)

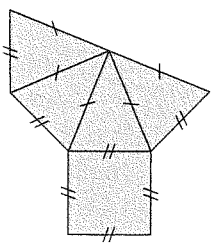


4 Describe the solid formed from each of these nets.

a)



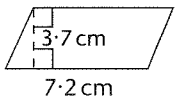
b)

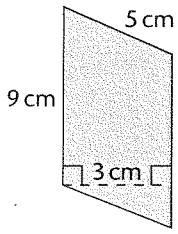


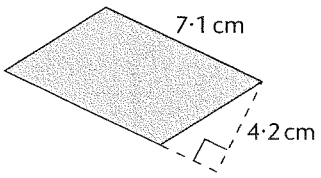
5 A triangle has vertices at A(6, 2), B(6, 7) and C(3, 5).
Draw triangle ABC on squared paper and calculate its area.

6 A pentagon has vertices at A(2, 1), B(6, 1), C(6, 3), D(5, 6) and E(2, 3).
Draw the pentagon on squared paper and calculate the area of each of these.
a) Rectangle ABCE
b) Triangle EDC
c) Pentagon ABCDE

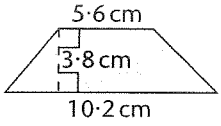
7 Calculate the area of each of these parallelograms.

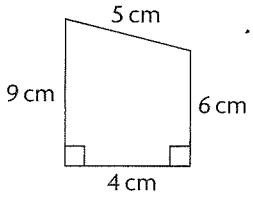
a)


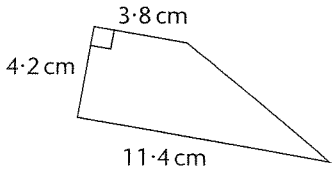
b)


c)


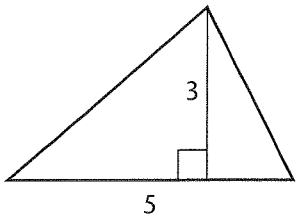
8 Calculate the area of each of these trapezia.

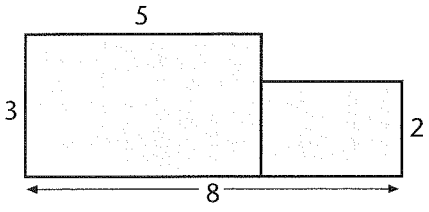
a)


b)


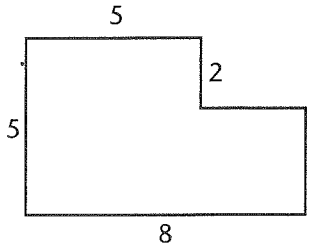
c)


9 Find the area of each of these shapes. All lengths are in centimentres.

a)


b)


10 Find the perimeter of each of these shapes. All lengths are in centimetres.

a)


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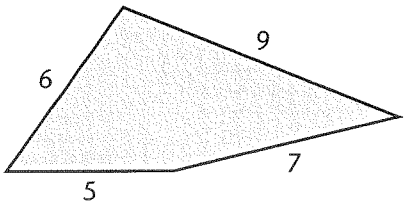
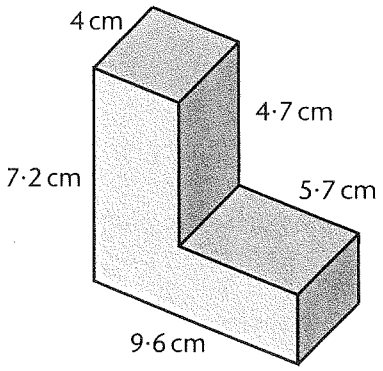


11 A room measures 4·2 m long by 3·2 m wide by 2·6 m high.
a) Calculate the volume of the room.
b) Calculate the area of the four walls and the ceiling.

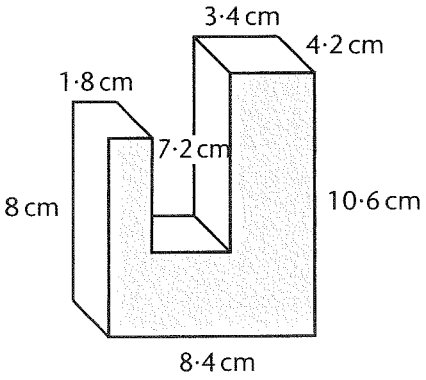
Jane paints the walls and ceiling. 1 litre of paint covers 13 m^2. The total area of the windows and door is 5 m^2.
c) How much paint will she need?

12 Find the volume of each of these shapes.

a)



b)



13 The data shows the length of the throws, in metres, in a school shot put competition.

4·4 5·4 8·5 9·2 7·3 5·7 9·9 9·6 7·4 9·1
7·5 7·0 8·3 4·9 5·7 6·4 6·7 7·3 8·2 9·0
5·2 7·0 8·9 9·1 5·2 6·4 7·3 8·2 5·9 5·0
6·5 7·9 8·2 8·9 5·3 5·2

a) Construct a stem-and-leaf diagram to show these lengths.
b) How many people took part in the competition?
c) Use your diagram to find the median length.

14 Amy has counted the number of matches in ten boxes. Here are the results.

80 83 85 84 86 82 84 85 85 86

a) Make a frequency table for Amy's results.
b) What is the mode of her results?
c) Use the frequency table to calculate the mean number of matches.
d) Use the original results to calculate the mean as a check.

15 A market researcher has counted the number of people living in the houses on North Close.

Number of people	Number of houses
1	4
2	6
3	9
4	12
5	7
6	3
7	1

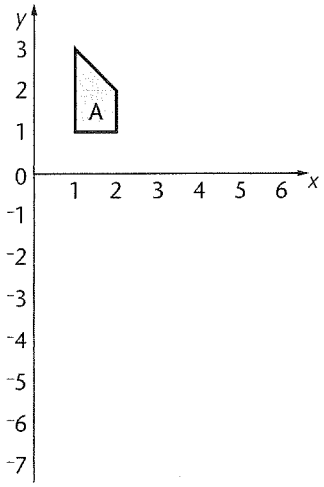
a) How many houses are there?
b) What is the modal number of people per house?
c) What is the mean number of people per house?
Give your answer to 1 decimal place.

16 The table shows the marks gained by students in an examination.

Mark	Frequency
$30 \leqslant m < 40$	8
$40 \leqslant m < 50$	11
$50 \leqslant m < 60$	18
$60 \leqslant m < 70$	13
$70 \leqslant m < 80$	8
$80 \leqslant m < 90$	12

a) Draw a frequency polygon to show these data.
b) Describe the distribution of the marks.
c) Which is the modal class?
d) How many students took the examination?
e) What fraction of students scored 70 or more in the examination?
Give your answer in its simplest form.

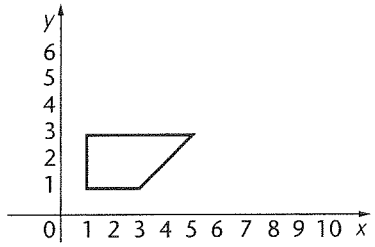
17 Copy the diagram.



a) Reflect trapezium A in the line $x = 3$. Label the image B.

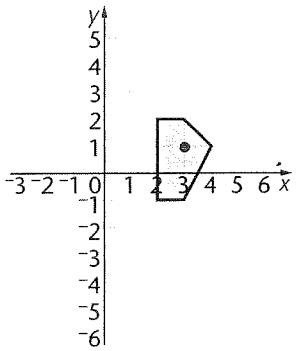
b) Reflect trapezium A in the line $y = -2$. Label the image C.

18 Copy the diagram.



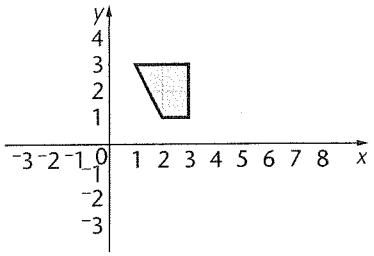
Enlarge the shape by scale factor 2, centre the origin.

19 Copy the diagram.



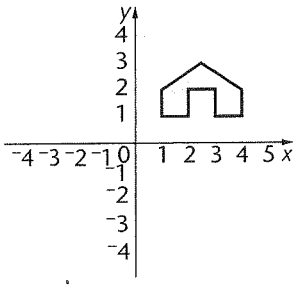
Enlarge the shape by scale factor 3, centre the point (3, 1).

20 Copy the diagram.



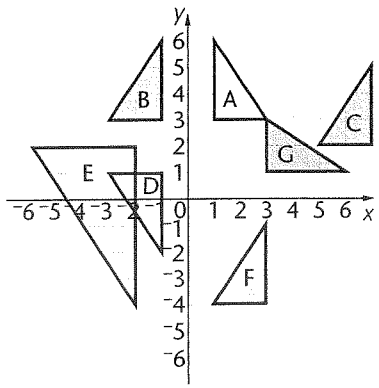
Translate the shape by $\begin{pmatrix} 4 \\ -3 \end{pmatrix}$.

21 Copy the diagram.



Rotate the shape through a three-quarter-turn anticlockwise about the origin.

22 Look at the diagram.



Describe fully the transformation that maps

a) A on to B.
b) B on to D.
c) B on to C.
d) D on to E.
e) F on to B.
f) A on to G.
g) G on to B.