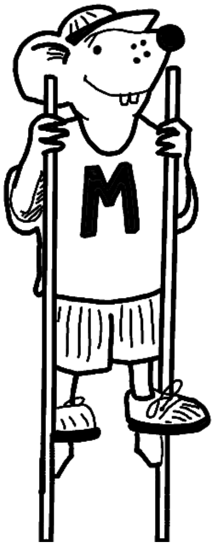


Booster Pages KS2

Co-ordinates

Level 4/5

Number of practice sheets: 10

MathSphere

Notes

All the questions in this topic so far set concern only co-ordinates in the first quadrant (i.e. with positive x and y co-ordinates. However, problems involving negative co-ordinates are covered in the year 6 syllabus of the Primary Framework Document and may therefore pop up at any time. With this in mind, most of the problems in this module are set with co-ordinates in the first quadrant, but there is a section involving negative co-ordinates at the end.

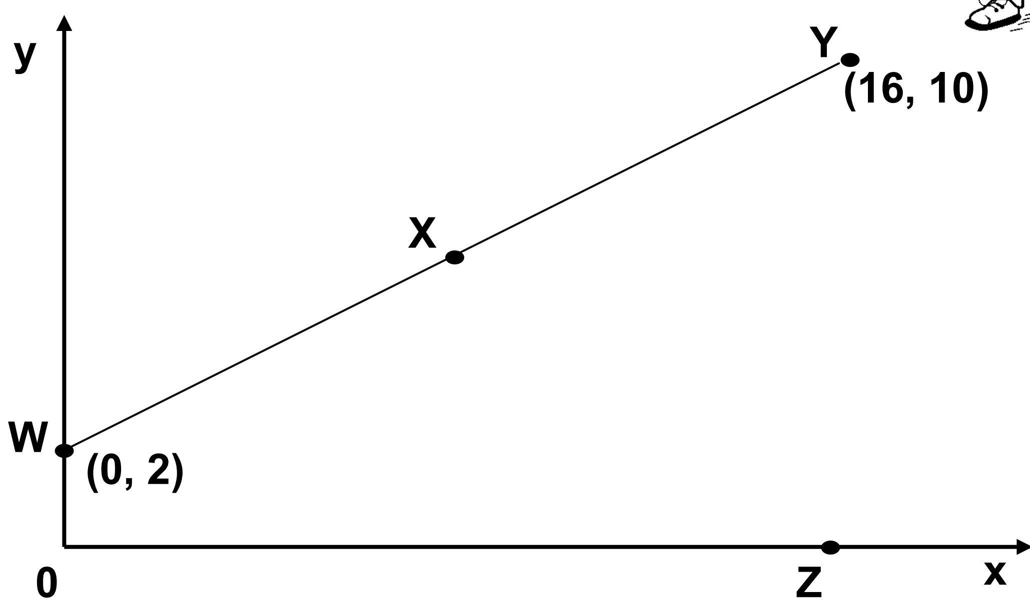
The whole module involves a complete understanding of how position is described using co-ordinates. Children should not only be able to describe the position of a point using co-ordinates, but should also be able to say how far one point is from another in both the x and y directions. They should then be able to find the co-ordinates of intermediate points and notice relationships such as "To get from one dot to another on this line you go along two squares and up one". (No algebra is needed to describe these relationships at this stage apart from knowing that the number on the horizontal axis is the x co-ordinate and the one on the vertical axis is the y co-ordinate.

When a shape is reflected on a grid (whether the grid is shown or not), children should be taught to find the distance from the mirror line to the corners of the shape and use this information to find the co-ordinates of the reflected shape.

1. Here are some great sheets on co-ordinates, but can you spell it?

Yes: **I T** Ha! Ha!

Here is a diagram with some points plotted.



X is half way between **W** and **Y**

a) What are the co-ordinates of **X** ? (,)

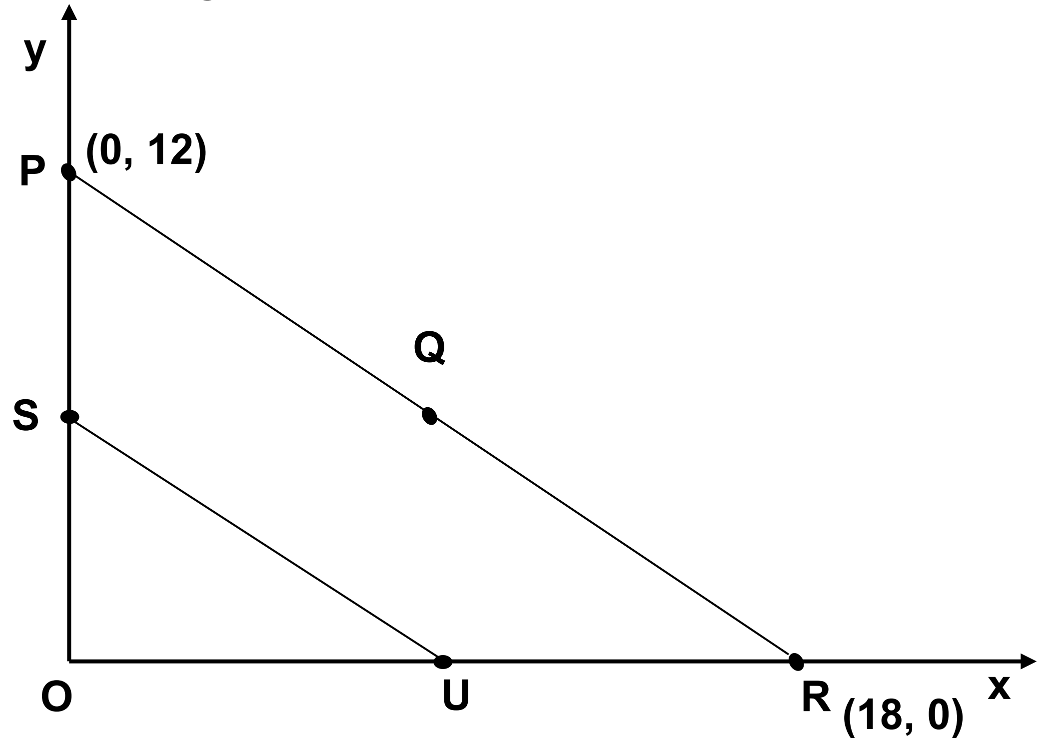
b) **Z** is directly below **Y** and on the **x** axis.
What are the co-ordinates of **Z** ? (,)

c) **V** is another point on the diagram which is **directly below X** and **above** the **x** axis. What could be the co-ordinates of **V** ?

(,)

d) On the diagram, plot the approximate position of the point **U(4, 1).**

1. Here is a diagram with some points plotted.



Q is half way between **P** and **R**
S is half way between **O** and **P**
SU is parallel to **PR**.

a) What are the co-ordinates of **Q** ? (,)

b) What are the co-ordinates of **S** ? (,)

c) What are the co-ordinates of **U** ? (,)

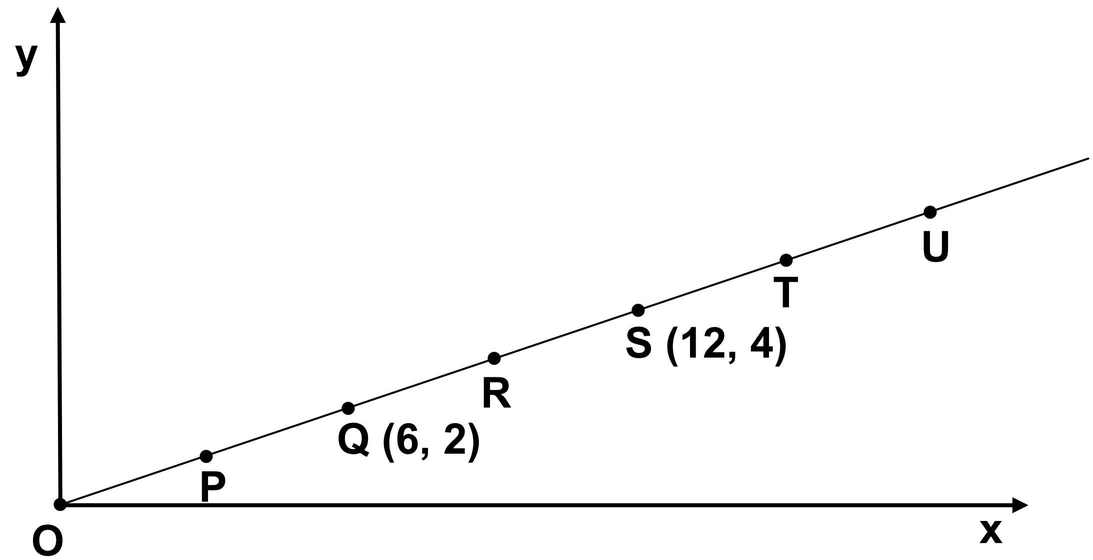
d) On the diagram, draw a straight line from **Q** to **O**.
This line crosses the line **SU** at **T**.

What are the co-ordinates of **T** ? (,)

e) Give the co-ordinates of one point inside the shape **PRUS**. (,)

f) What is the name of shape **PRUS**?

1.



The points O, P, Q, R, S, T and U are equally spaced along the line.

a) What are the co-ordinates of the point **P** ? (,)

b) What are the co-ordinates of the point **R** ? (,)

c) What are the co-ordinates of the point **half way** between **T** and **U** ?

(,)

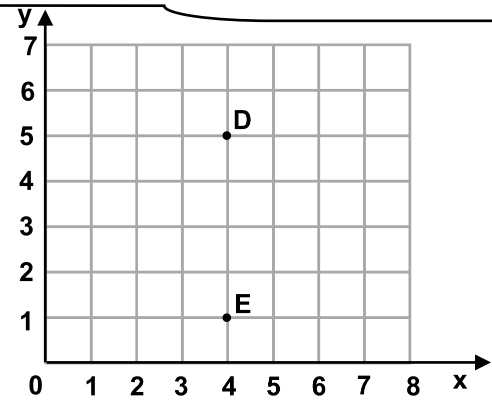
d) Sam thinks the point **(330, 110)** would lie on this line if it were extended far enough.
Is Sam correct? Explain your answer.

Yes/No

What's deep blue and weighs three tonnes?

An elephant holding its breath!!!

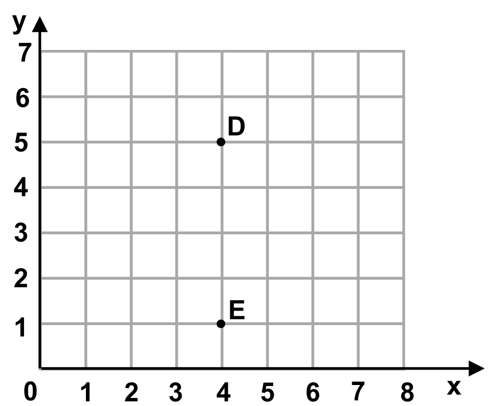
1.

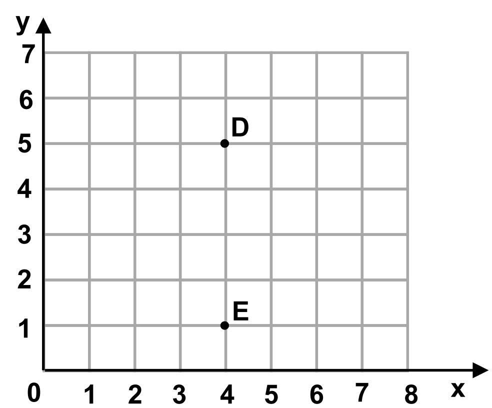


D and **E** are two corners of a **square**.

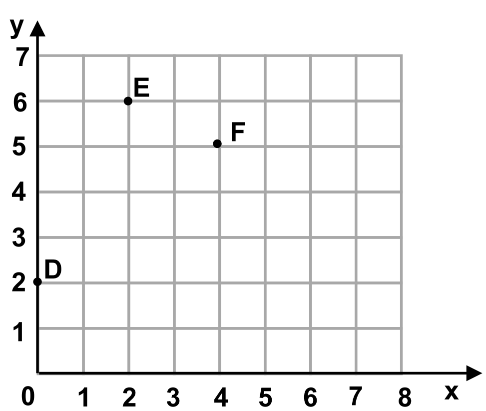
On the diagram draw the other two corners of the square, **P** and **Q**.

Can you do this in **three** different ways?

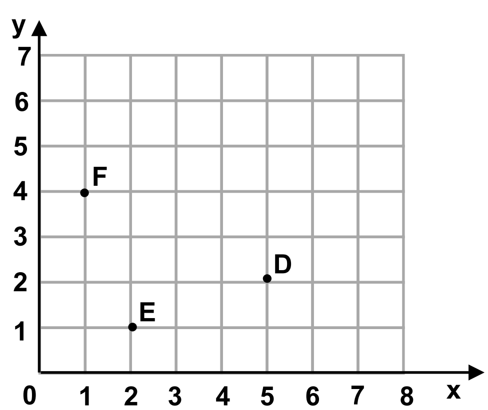




2. On each diagram **D**, **E** and **F** are **three corners of a rectangle**. Write the co-ordinates of the **fourth** corner for each diagram.

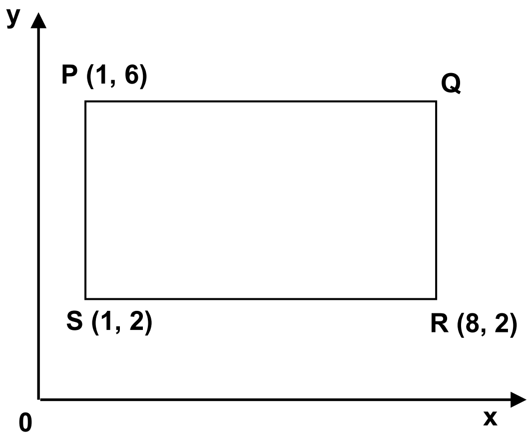


(,)



(,)

1.



PQRS is a rectangle.

What are the co-ordinates of point **Q** ?

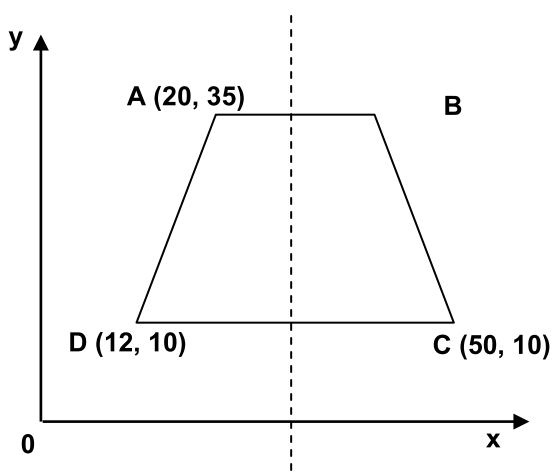
(,)

Draw the diagonals of the rectangle.

What are the co-ordinates of the middle of the rectangle?

(,)

2.



ABCD is a trapezium with reflective symmetry about the dotted line.

What are the co-ordinates of point **B** ?

(,)

Draw the diagonals **AC** and **BD** of the trapezium.

What is the **x co-ordinate** of the point where the diagonals meet?

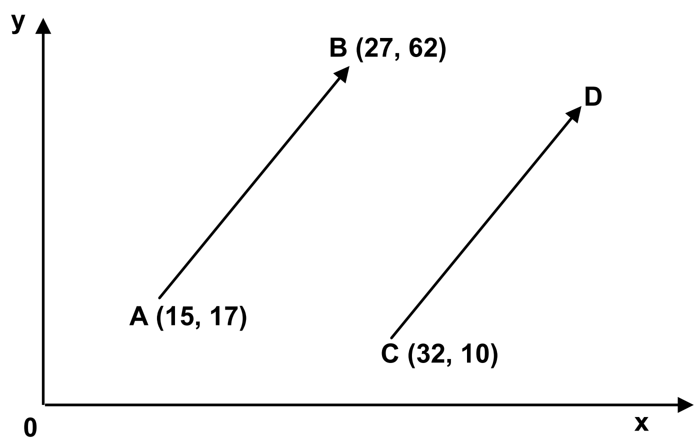
3. These four points are the corners of a rectangle:

A (27, 43), B (51, 43), C (51, 15) , D (27, 15).

What are the co-ordinates of the **centre** of the rectangle?

(,)

1.

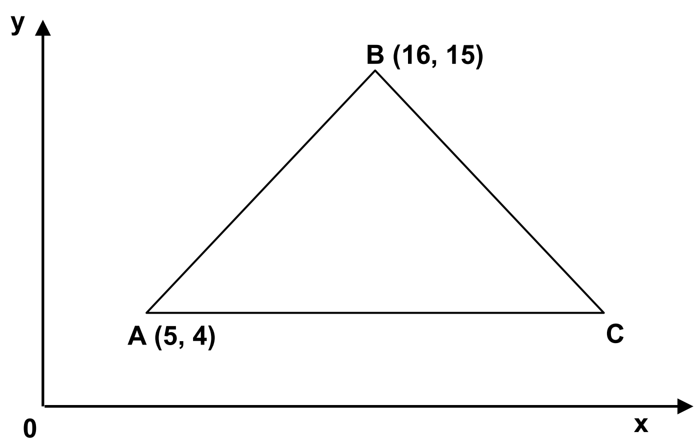


AB and CD are two parallel arrows of the same length.

What are the co-ordinates of the end of the right arrow, **D** ?

(,)

2.



ABC is an isosceles triangle with AB = CB.

What are the co-ordinates of point **C** ?

(,)

M is the mid-point of **AC**.
What are the co-ordinates of **M** ?

(,)

The triangle is rotated clockwise **90^o** about the point **C**.

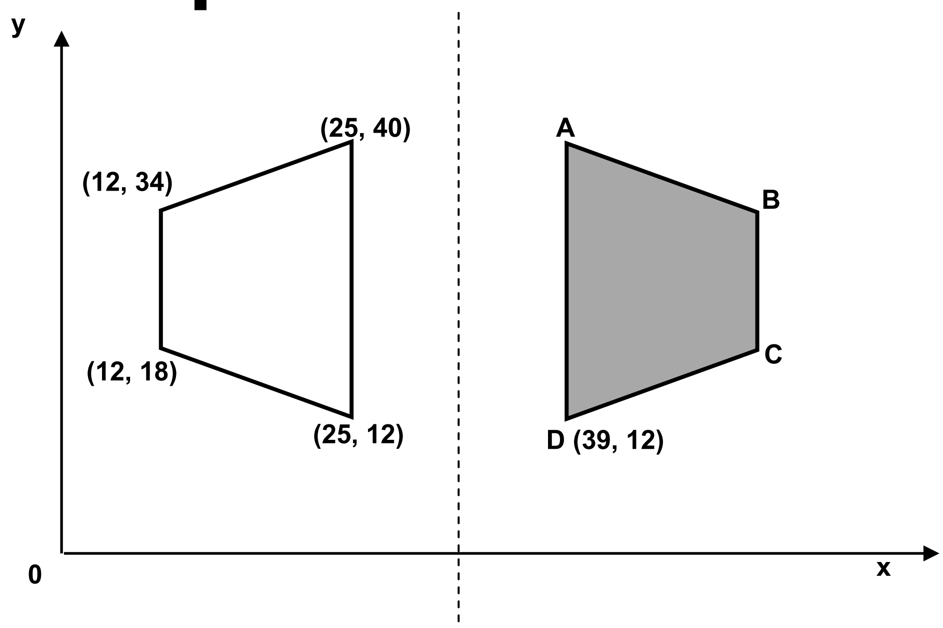
What are the new co-ordinates of the point **A** ?

(,)

Will the person who stole the school ladder please return it or further steps will be taken!
Headteacher

Oh, very funny!!

1.



The shaded trapezium is a reflection in the dotted line of the white trapezium.

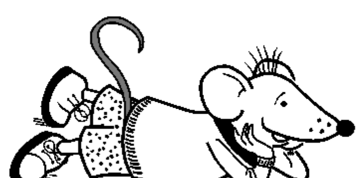
a) What are the co-ordinates of **A, B** and **C** ?

A (,   )   B (,   )   C (,   )

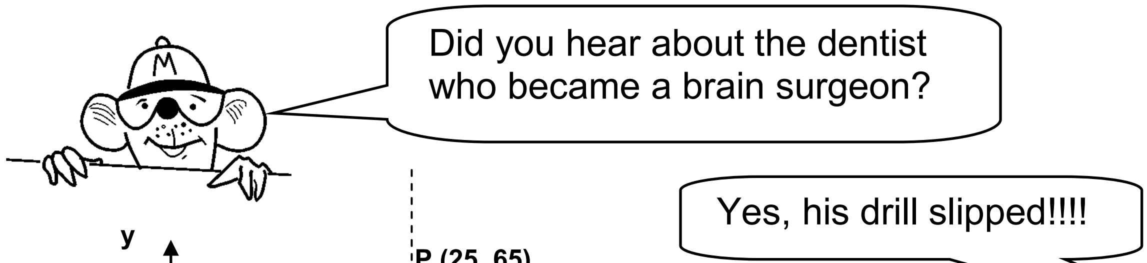
b) If the shaded trapezium is **rotated 90° anti-clockwise about A**, what are the new co-ordinates of the point **D** ?

(,   )

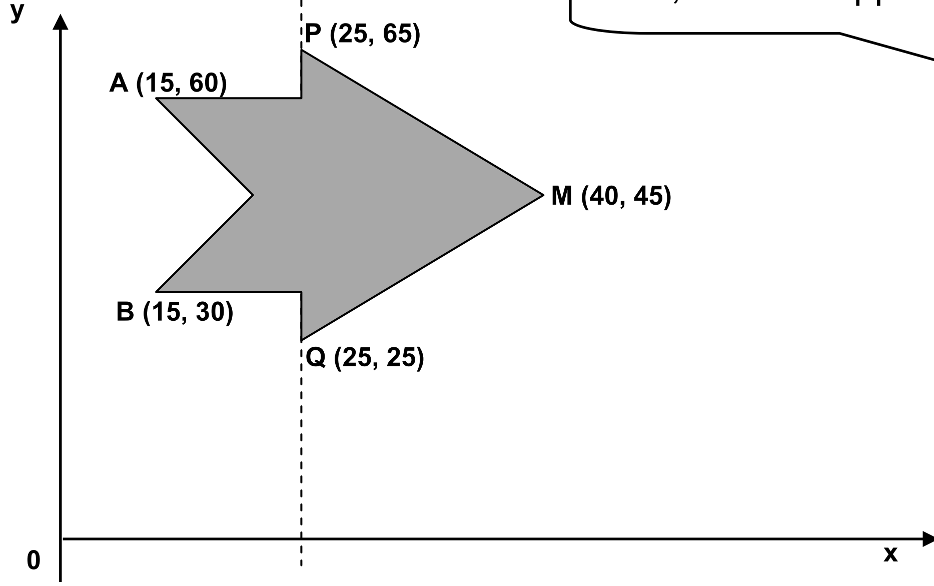
c) Draw the diagonals on the white trapezium.
What is the **y co-ordinate** of the point where the diagonals cross?



I should think after that you are ready for a nice piece of cheese!



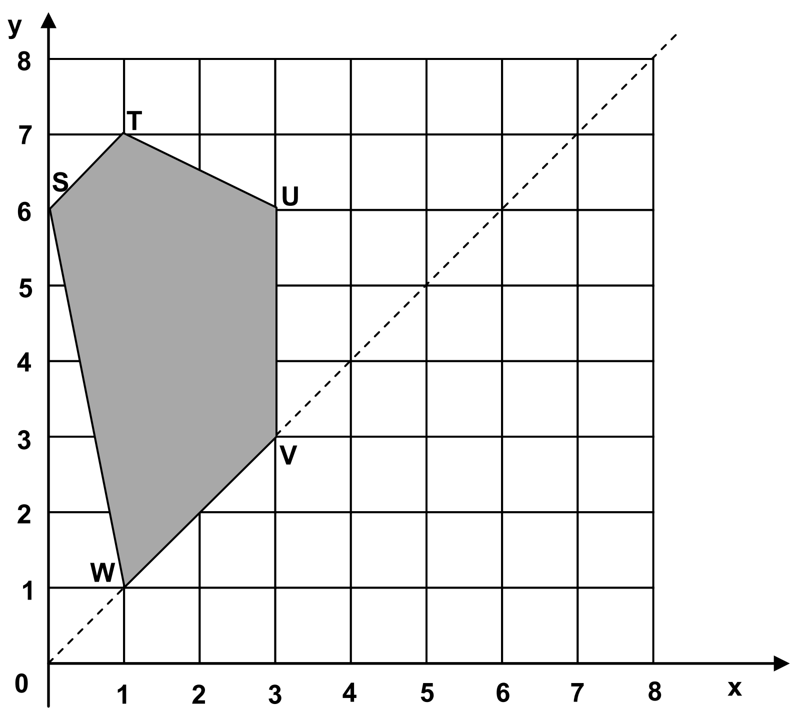
1.



The arrow shape is reflected in the dotted mirror line.
What are the co-ordinates of the new positions of **A, B, P, Q** and **M** ?

A (,) B (,) P (,) Q (,) M (,)

2. The shape **STUVW** is reflected in the dotted mirror line.

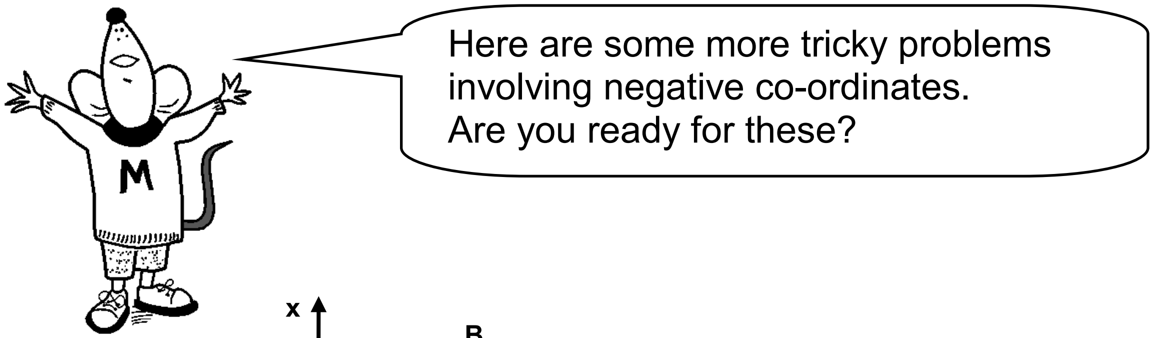


What are the co-ordinates of the new positions of **S, T, U, V** and **W ?**

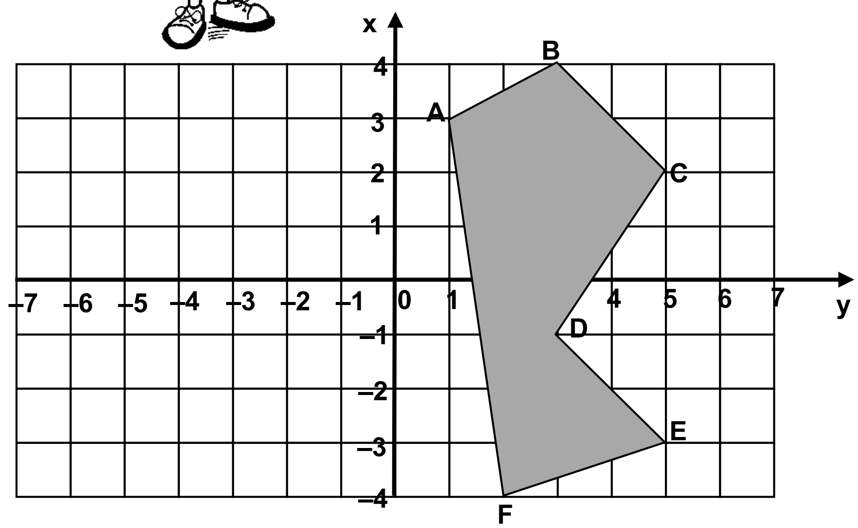
S (,) T (,)

U (,) V (,)

W (,)



1.



a) Draw the shaded shape after it has been reflected in the **y** axis.

b) Write the co-ordinates of the new positions of the corners of the shape after the reflection.

A (,) **B** (,) **C** (,) **D** (,) **E** (,) **F** (,)

c) What is the name of the shaded shape?

d) If the original shaded shape is rotated **90° clockwise** about the point **A**, what will be the new co-ordinates of the point **F** ?

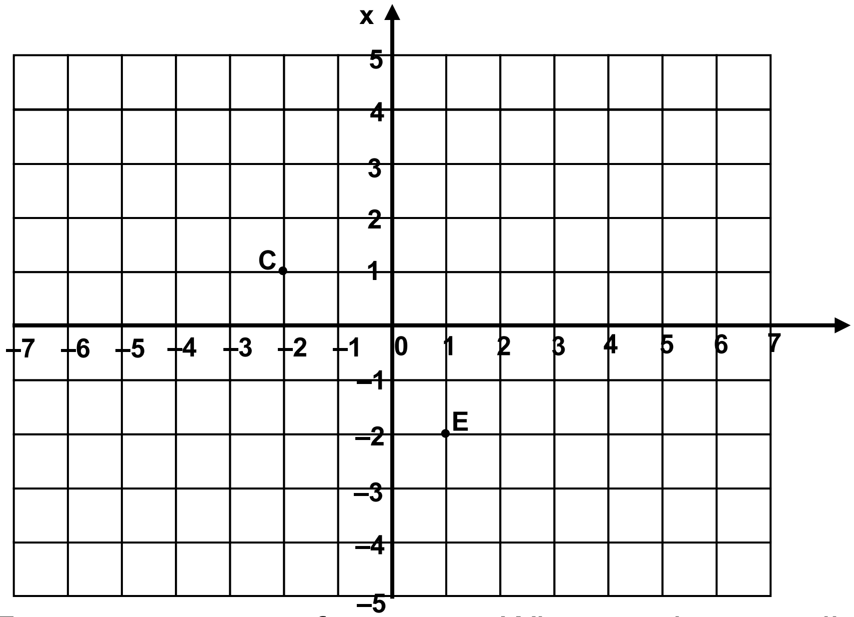
2. The following points are reflected in the **x** axis.
What are the co-ordinates of their reflections?

(6, 10) ⟶ (,) **(–5, 2)** ⟶ (,)

(4, –8) ⟶ (,) **(–6, –5)** ⟶ (,)

(0, 7) ⟶ (,) **(–12, 0)** ⟶ (,)

1.

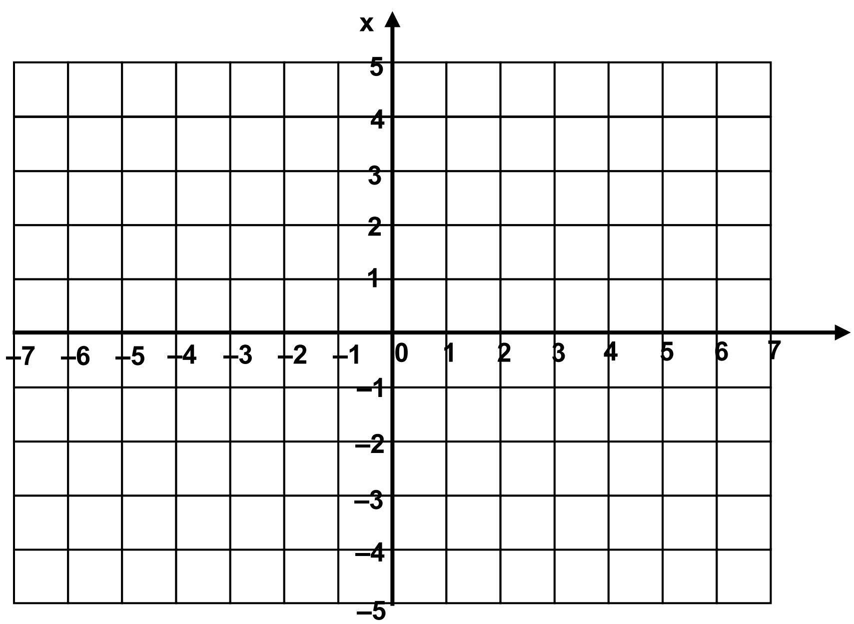


C and **E** are two corners of a square. What are the co-ordinates of the other two corners?

How many ways can you find of solving this problem?

(,) and (,)	**(,) and (,)**	**(,) and (,)**

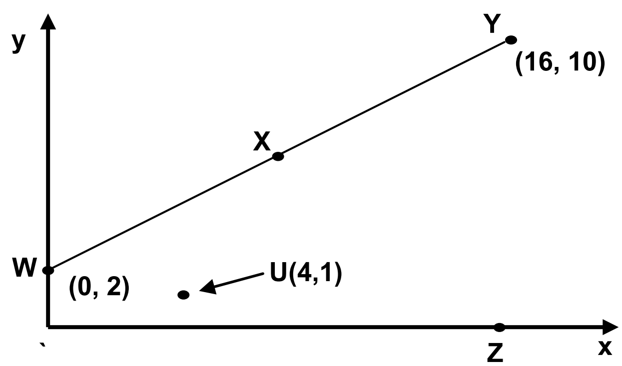
2.



Here is a rule for plotting points:
The first co-ordinate for each point is three times the second co-ordinate subtract 1.
How many points can you find that fit this rule?
Put them on the above grid.

Answers

Page 3
a) (8, 6) **b)** (16, 0)
C) (8, y) where y is greater than 0 and less than 6.



Page 4
a) (9, 6) **b)** (0, 6) **c)** (9, 0) **d)** Draw line QO T is (4.5, 3)
e) Give co-ordinates of one point within PRUS, eg. (9,2).
f) Trapezium.

Page 5
1. a) (3, 1) **b)** (9,3) **c)** (16.5, 5.5) **d)** Yes, the x co-ordinate is always three times the y co-ordinate which is true for (330, 110).

Page 6
1. Co-ordinates of other corners can be any of:
(0, 1) and (0, 5) OR (8, 1) and (8, 5) OR (2, 3) and (6, 3)

2. First diagram: (2, 1) Second diagram: (4, 5)

Page 7
1. Q is (8, 6) Middle of rectangle is (4.5, 4)
2. B is (42, 35) X co-ordinate of meeting point of diagonals is 31.
3. (39, 29)

Answers (Contd)

Page 8

1. (44, 55)

2. Point C is (27, 4) M is (16, 4) New A is (27, 26)

Page 9

1. a) A(39, 40) B(52, 34) C(52, 18)

b) New D is (67, 40)

c) Y co-ordinate is 26

Page 10

1. New positions: A(35, 60) B(35, 30) P(25, 65) Q(25,25) M(10, 45)

2. S(6, 0) T(7, 1) U(6, 3) V(3, 3) W(1, 1)

Page 11

a) Draw reflection

b) A(–1, 3) B(–3, 4) C(–5, 2) D(–3, –1) E(–5, –3) F(–2, –4)

c) Hexagon

d) (–6, 2)

2. **(6, 10) ⟶ (–6, 10)** **(–5, 2) ⟶ (5, 2)**

(4, –8) ⟶ (–4, –8) **(–6, –5) ⟶ (6, –5)**

(0, 7) ⟶ (0, 7) **(–12, 0) ⟶ (12 , 0)**

Page 12

1. (1, 4) and (4, 1)
(–5, –2) and (–2, –5)
(1, 1) and (–2, –2)

2. There are an infinite number of points, some using whole numbers such as (5, 2), (2, 1) and (–7, –2) and many more with decimal numbers.
All the points lie on a line joining (5, 2) to (–7, –2), extended in both directions.