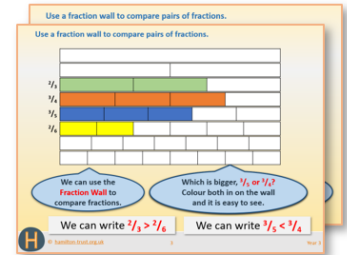


# Week 9, Day 5

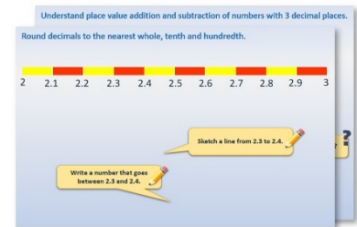
## Reflections

Each day covers one maths topic. It should take you about 1 hour or just a little more.

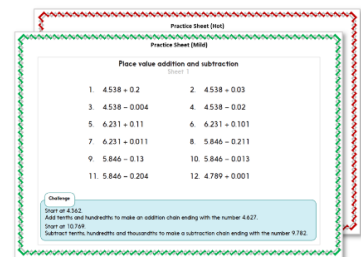
1. If possible, watch the **PowerPoint presentation** with a teacher or another grown-up.



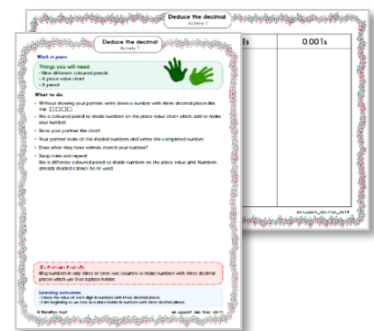
OR start by carefully reading through the **Learning Reminders**.



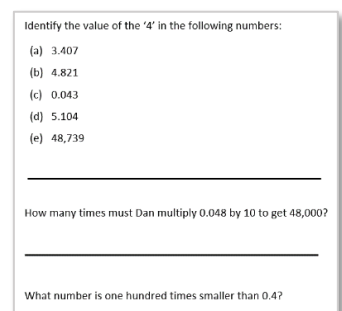
2. Tackle the questions on the **Practice Sheet**. There might be a choice of either **Mild** (easier) or **Hot** (harder)! Check the answers.



3. Finding it tricky? That's OK... have a go with a grown-up at **A Bit Stuck?**



4. Have I mastered the topic? A few questions to **Check your understanding**. Fold the page to hide the answers!

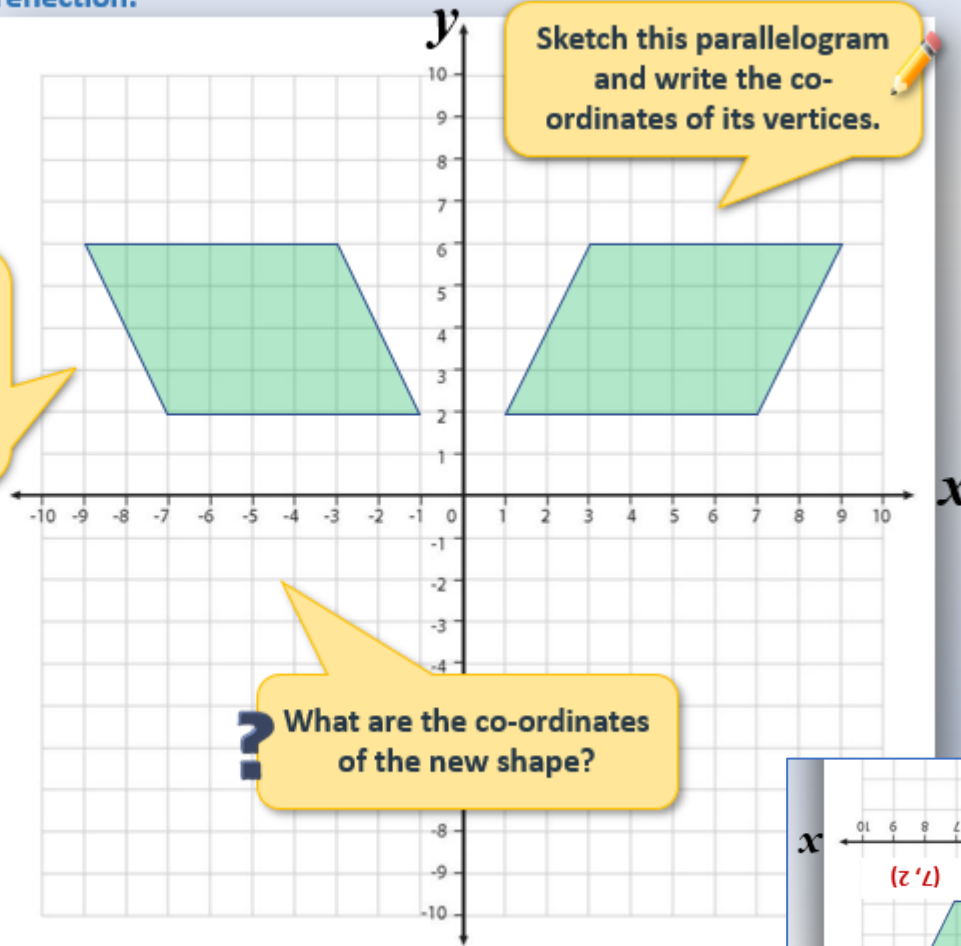


# Learning Reminders

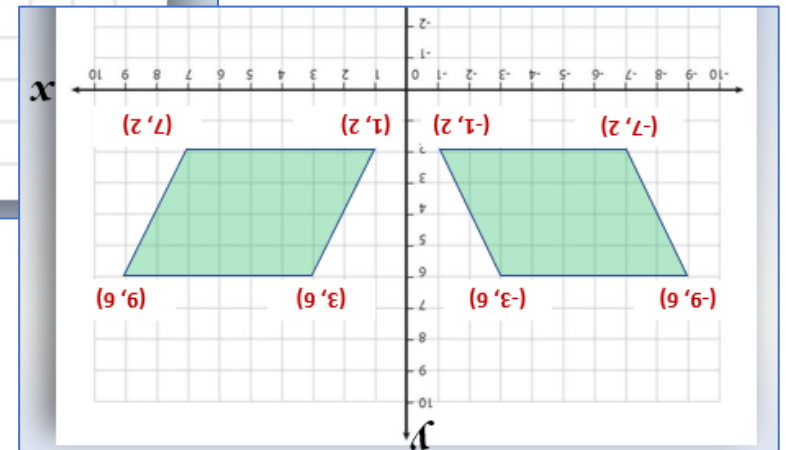
Work out new co-ordinates after a reflection.

We reflect this parallelogram across the y-axis. The new shape must be the same distance away from the y-axis as the first one, but 'flipped' over.

Sketch this parallelogram and write the co-ordinates of its vertices.



? What are the co-ordinates of the new shape?



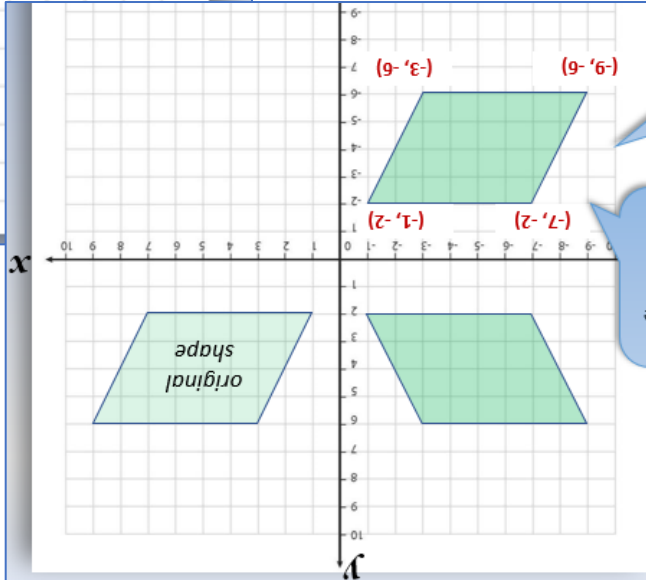
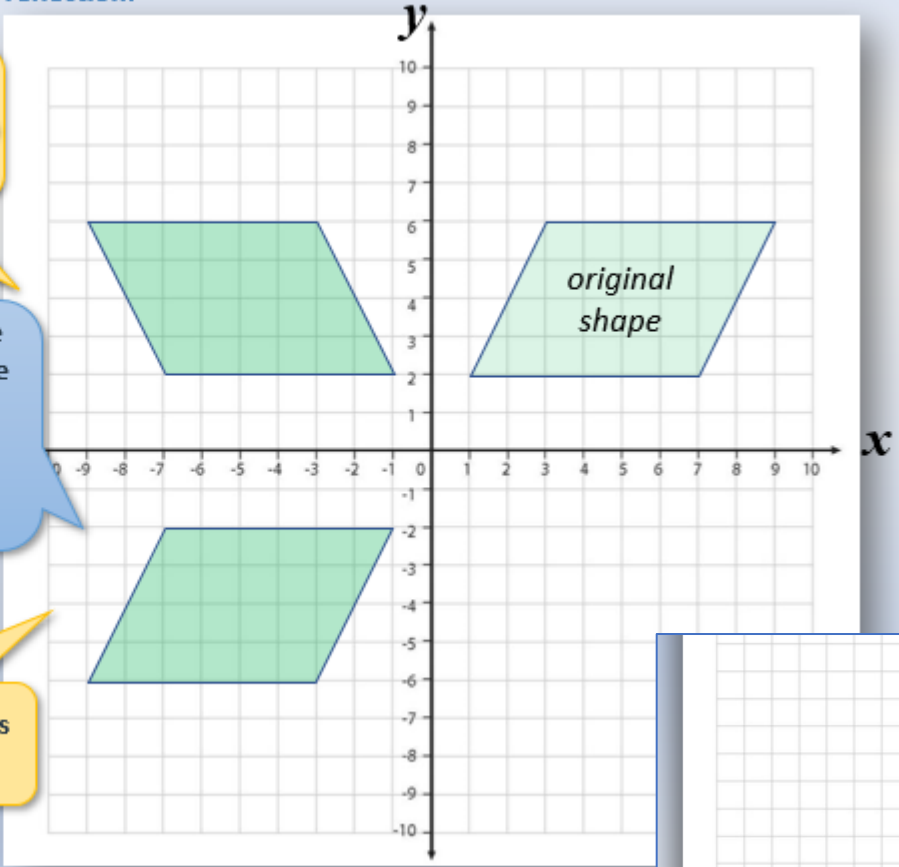
# Learning Reminders

Work out new co-ordinates after a reflection.

Now reflect this new shape in the x-axis.

What do you notice about the shape itself compared with the original one?  
 What about its position?  
 Is this different from a translation?

? What are the co-ordinates of the new shape?

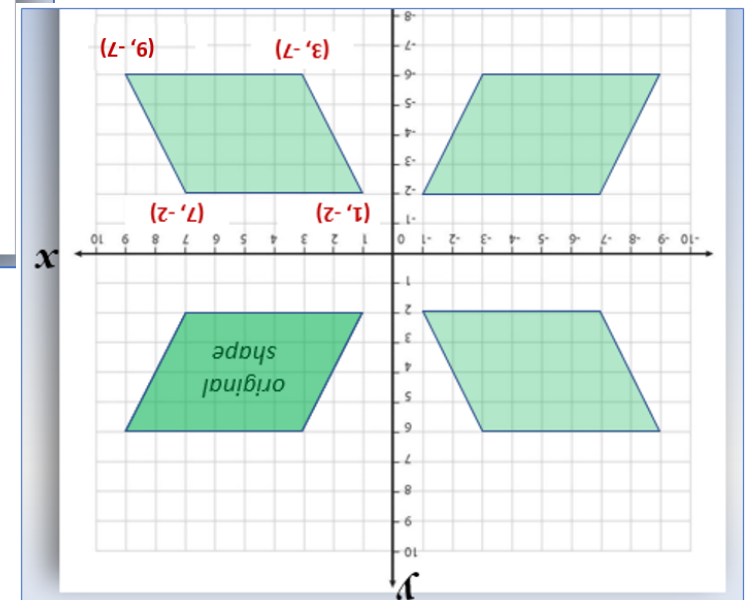
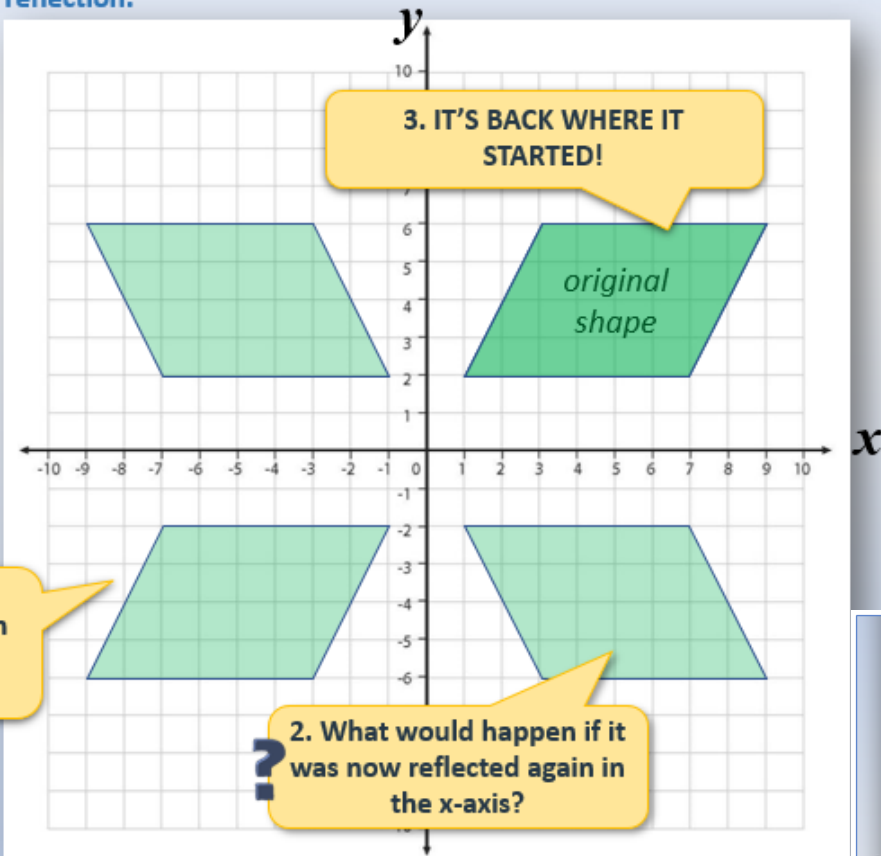


The shape is in the same orientation as for a translation.

What do you notice about the shape itself compared with the original one?  
 Is this different from a translation?  
 What about its position?

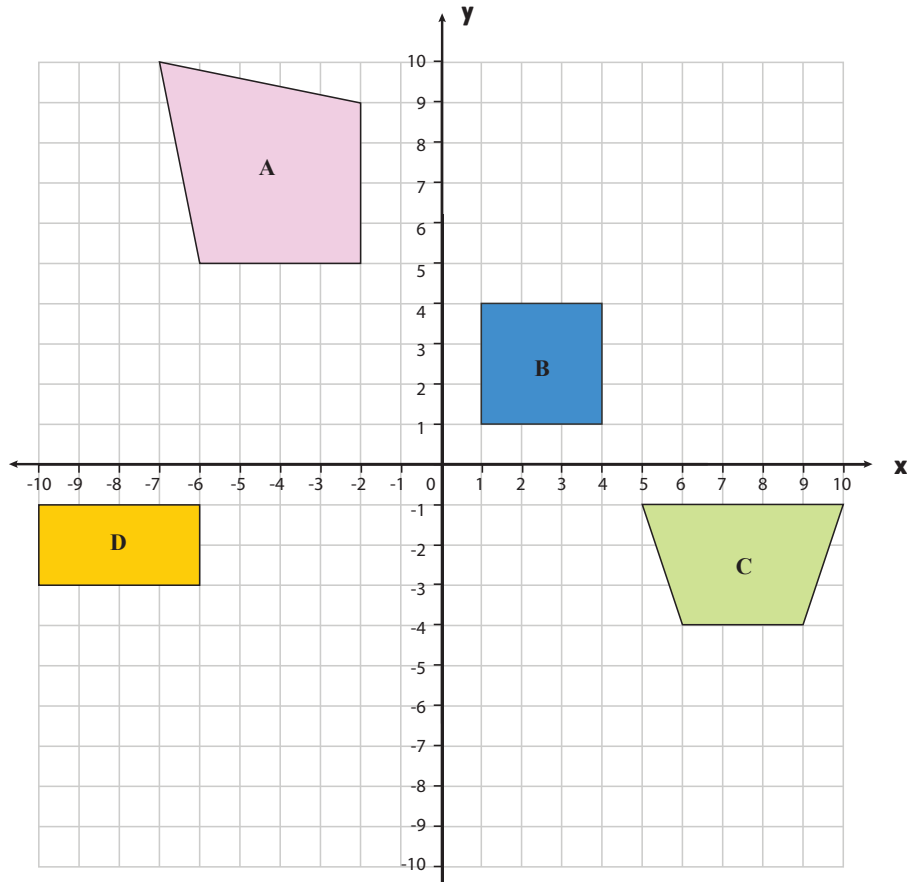
# Learning Reminders

Work out new co-ordinates after a reflection.



## Practice Sheet Mild

### Reflected quadrilaterals



Look at each quadrilateral and write its name.  
Write its co-ordinates.

1. Reflect shapes A then B in the  $y$ -axis. Write the co-ordinates of the reflected shapes.
2. Reflect shapes C then D in the  $x$ -axis. Write the co-ordinates of the reflected shapes.

#### Challenge

Draw a quadrilateral with no right angles and no parallel sides.

Write its co-ordinates.

Write the co-ordinates the shape will have after being reflected in the  $y$ -axis.

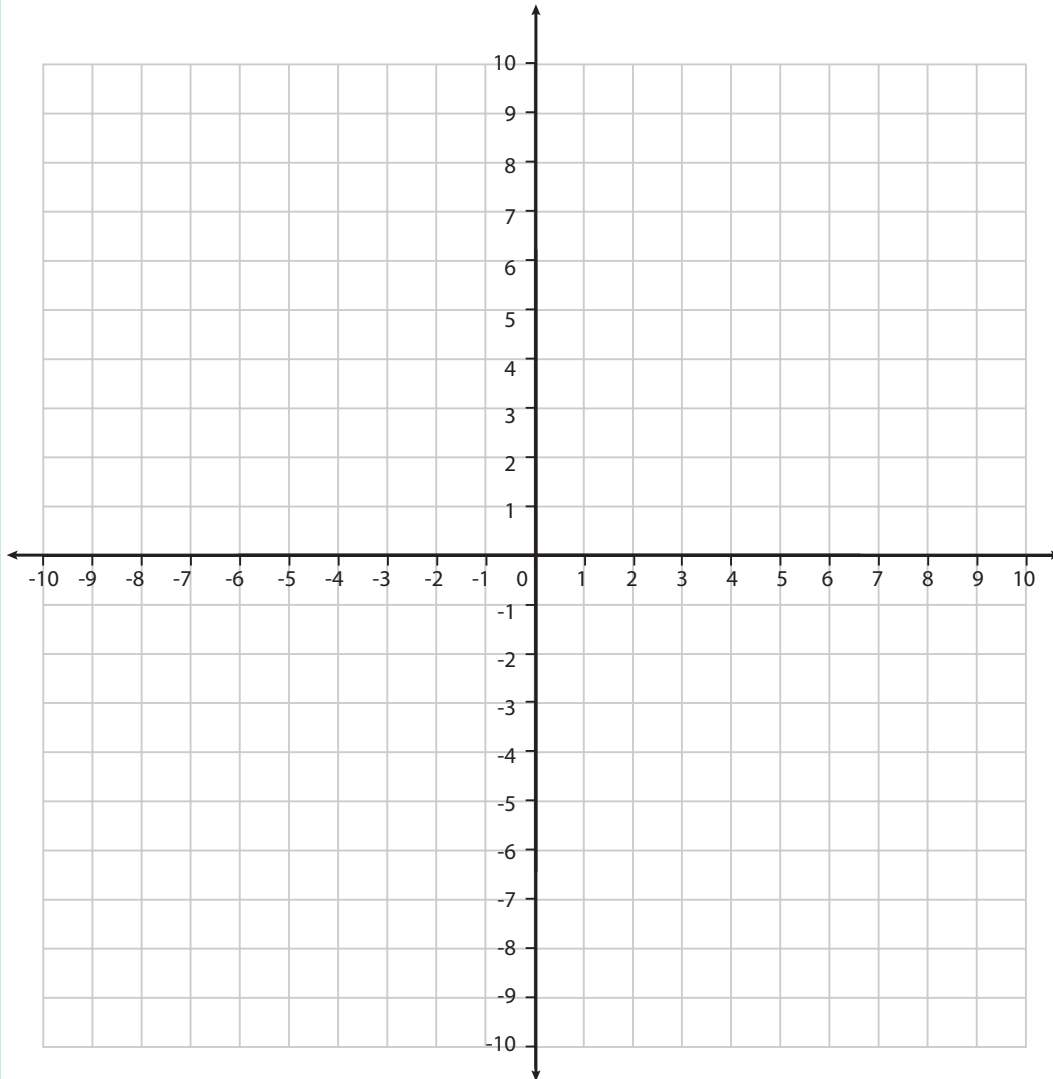
Reflect the shape in the  $y$ -axis.

Were your co-ordinates correct?

## Practice Sheet Hot

### Reflecting quadrilaterals

Plot each quadrilateral and its image. Write down the co-ordinates of the vertices of the image.



Shape	Co-ordinates of vertices	Reflected in	Co-ordinates of vertices of image
Square	A (-7, 2) B (-5, 2) C (-7, 0) D (-5, 0)	x-axis	A ( , ) B ( , ) C ( , ) D ( , )
Rectangle	E (-9, 9) F (-4, 9) G (-9, 7) H (-4, 7)	y-axis	E ( , ) F ( , ) G ( , ) H ( , )
Rhombus	I (-4, 2) J (-2, 3) K (-2, 1) L (0, 2)	x-axis then y-axis	I ( , ) J ( , ) K ( , ) L ( , )
Parallelogram	M (-5, 4) N (-4, 6) O (-2, 4) P (-1, 6)	y-axis then x-axis	M ( , ) N ( , ) O ( , ) P ( , )
Trapezium	Q (-9, 3) R (-8, 6) S (-7, 6) T (-6, 3)	x-axis then y-axis	Q ( , ) R ( , ) S ( , ) T ( , )
Kite	U (-3, 8) V (-2, 9) W (-2, 6) X (-1, 8)	y-axis then x-axis	U ( , ) V ( , ) W ( , ) X ( , )

## Practice Sheets Answers

### Reflected quadrilaterals (mild)

#### A Quadrilateral

$(-2, 5), (-2, 9), (-6, 5), (-7, 10)$

Reflection in  $y$ -axis:  $(2, 5), (2, 9), (6, 5), (7, 10)$

#### B Square

$(1, 1), (1, 4), (4, 1), (4, 4)$

Reflection in  $y$ -axis:  $(-1, 1), (-1, 4), (-4, 1), (-4, 4)$

#### C Trapezium

$(5, -1), (10, -1), (6, -4), (9, -4)$

Reflection in  $x$ -axis:  $(5, 1), (10, 1), (6, 4), (9, 4)$

#### D Rectangle

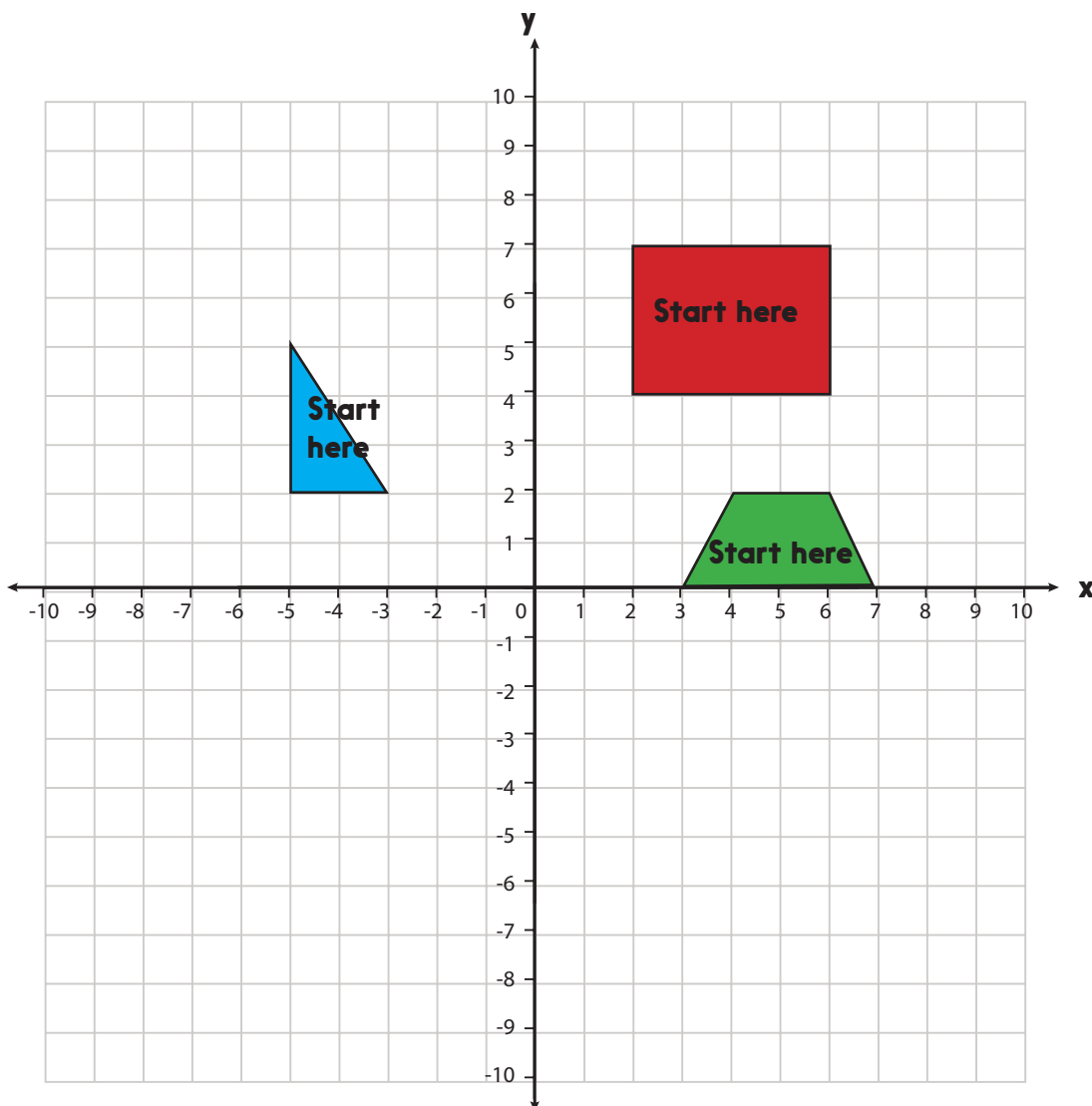
$(-6, -1), (-6, -3), (-10, -1), (-10, -3)$

Reflection in  $x$ -axis:  $(-6, 1), (-6, 3), (-10, 1), (-10, 3)$

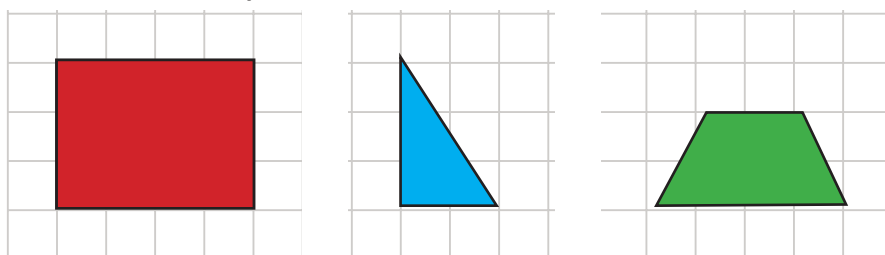
### Reflecting quadrilaterals (hot)

Shape	Co-ordinates of vertices	Reflected in	Co-ordinates of vertices of image
Square	A $(-7, 2)$ B $(-5, 2)$ C $(-7, 0)$ D $(-5, 0)$	$x$ -axis	A $(-7, -2)$ B $(-5, -2)$ C $(-7, 0)$ D $(-5, 0)$
Rectangle	E $(-9, 9)$ F $(-4, 9)$ G $(-9, 7)$ H $(-4, 7)$	$y$ -axis	E $(9, 9)$ F $(4, 9)$ G $(9, 7)$ H $(4, 7)$
Rhombus	I $(-4, 2)$ J $(-2, 3)$ K $(-2, 1)$ L $(0, 2)$	$x$ -axis then $y$ -axis	I $(4, -2)$ J $(2, -3)$ K $(2, -1)$ L $(0, -2)$
Parallelogram	M $(-5, 4)$ N $(-4, 6)$ O $(-2, 4)$ P $(-1, 6)$	$y$ -axis then $x$ -axis	M $(5, -4)$ N $(4, -6)$ O $(2, -4)$ P $(1, -6)$
Trapezium	Q $(-9, 3)$ R $(-8, 6)$ S $(-7, 6)$ T $(-6, 3)$	$x$ -axis then $y$ -axis	Q $(9, -3)$ R $(8, -6)$ S $(7, -6)$ T $(6, -3)$

## A Bit Stuck? Time to reflect



- Cut out these shapes.



- Place the rectangle on the starting position in the co-ordinates grid.
- Write the co-ordinates of the four vertices.
- Reflect the rectangle in the  $y$ -axis. Make sure you turn it over as you do so. Write the new co-ordinates. The  $x$  co-ordinates will have changed but not the  $y$  coordinates.
- Move the rectangle back to the start.
- Reflect the rectangle in the  $x$ -axis. Write the new co-ordinates. Describe what happens to the co-ordinates this time...
- Repeat for the triangle and trapezium.



## Check your understanding

### Questions

A rectangle is reflected in the x-axis.

Its co-ordinates are now: (2, -1), (7, -1), (2, -6) and (7, -6). Draw it in its original position.

---

A triangle is reflected in the y-axis.

Its co-ordinates are now: (2, 0) (5, 2) and (3, 7). Draw it in its original position.

---

(0,0) (5,0) (5,5) (0,5) is a shape.

When it is reflected in the y-axis, two pairs of co-ordinates do not change. Why not?

Sketch it to explain.

*Fold here to hide answers*

---

## Check your understanding

### Answers

A rectangle is reflected in the x-axis.

Its co-ordinates are now: (2, -1), (7, -1), (2, -6) and (7, -6).

Draw it in its original position.

(2, 1), (7, 1), (2, 6) and (7, 6). Originally it must have been in the first quadrant. The x values are unaffected by the reflection.

---

A triangle is reflected in the y-axis. Its co-ordinates are now: (2,0) (5,2) and (3,7).

Draw it in its original position.

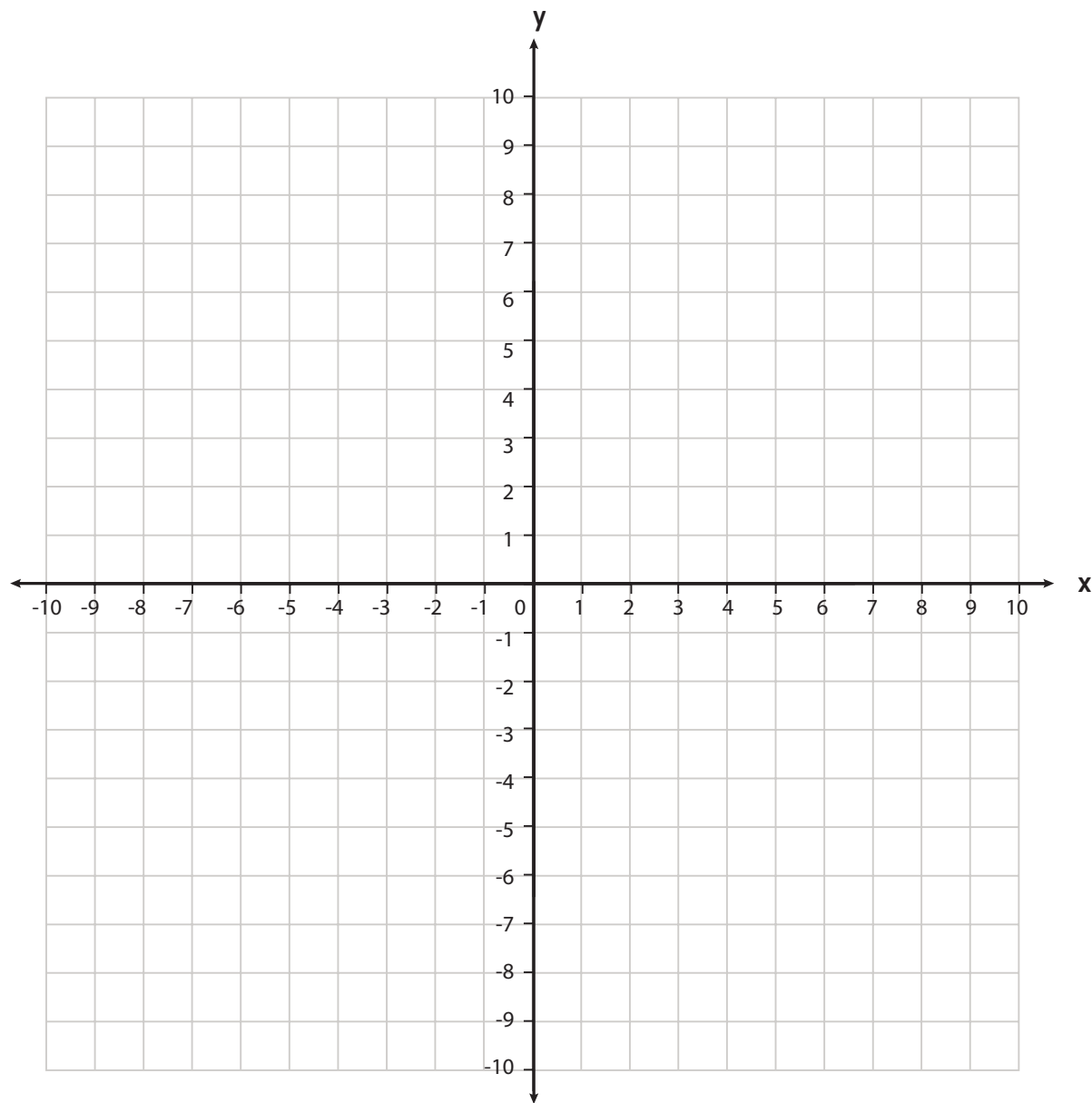
(-2, 0) (-5, 2) and (-3, 7). Originally it must have been in the 2<sup>nd</sup> quadrant (on the left of the y-axis above the x-axis). The y- values are unchanged by the reflection.

---

(0,0) (5,0) (5,5) (0,5) is a shape.

When it is reflected in the y-axis, two pairs of co-ordinates do not change. Why not? (0,0) and (0,5) do not move as they are located on the y-axis itself.

Sketch it to explain. As before, look for accurately plotted shapes.



1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30  
31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50  
100 99 98 97 96 95 94 93 92 91 90 89 88 87 86 85 84 83 82  
81 80 79 78 77 76 75 74 73 72 71 70 69 68 67 66 65 64 63 62 61 60 59 58 57 56 55 54 53 52 51