

Sutton Maths Class

Year 5 - Week 25 - Transformations

Starter:

1 $\frac{2^{16}}{3^{24}} + \frac{3^{18}}{4^{24}} - \frac{1^4}{6^{24}} = \frac{16+18-4}{24} = \frac{34-4}{24} = \frac{30}{24} = \frac{15}{12} = 1\frac{3}{12} = 1\frac{1}{4}$
or $\frac{15}{12} = \frac{5}{4}$

2 $\frac{6}{7} \div \frac{7^3}{3^7} = \frac{18}{49}$

3 What is 45% as a fraction?

$$\frac{45}{100} = \frac{9}{20}$$

4 What is $\frac{9}{100}$ as a decimal? 0.09

5 $80 \times 5.5 = 440$
 $80 \times 55 = 4400$

6 $400 \div 0.5 = 800$
 $\frac{55}{8}$
 $\frac{440}{4}$

7 Find $\frac{4}{7}$ of £3.50.
 $\frac{4}{7} = £0.50$ $\frac{4}{7} = 0.50 \times 4 = £2$

8 Decrease 6000kg by 8%

$$10\% = 600$$

$$1\% = 60$$

$$2\% = 120$$

$$8\% = 10\% - 2\% \text{ or } 1\% \times 8$$

$$= 600 - 120 = 480 \text{ kg}$$

9 Calculate $7 - 10 = -3$



10 Write 100 as a product of primes.

$$2 \times 2 \times 5 \times 5 \text{ or } 2^2 \times 5^2$$

11 Find the highest common factor of 200 and 60. 20

12 What is the next term: 8, 4, 2, 1, 0.5, 0.25 ? or $\frac{1}{4}$
 $\div 2 = 2 \div 2 \div 2 \div 2$ 'half of half'

13 $5^2 - 7 \times 3 - 1 = 3$
 $25 - 21 - 1$



14 Split £655 in the ratio of 3:2. $\frac{131}{5655}$ $131 \times 3 = 393$ $131 \times 2 = 262$

15 Find the n^{th} term of 2, 7, 12, 17, 22 ... $5n - 3$
 $+5 +5 +5 +5$

16 Solve $7x + 4 = 39$ $39 - 4 = 35$ $35 \div 7 = 5$

17 Solve $\frac{5x}{2} = 20$ $x = 8$
 $5x = 40$

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- 18 I roll a fair dice 60 times. How many times would I expect to roll a 6? $60 \div 6 = 10$
- 19 Find the area of a rectangle with length 5m and an perimeter of 16cm.
 (term) $5 \times 3 = 15 \text{ cm}^2$
 3cm
 5cm
- 20 How many edges does a cube have? 6
- 21 Find the volume of a cube with side 15cm. $15 \times 15 \times 15 = 225 \times 15$
 3375 cm^3
 
- 22 A 1 m^3 box is filled with small cubes with sides 10 cm^3 . What is the maximum number of small cubes that will fit on the bottom of the box?
 

challenge:
thought: what would this
be in m^3 ?

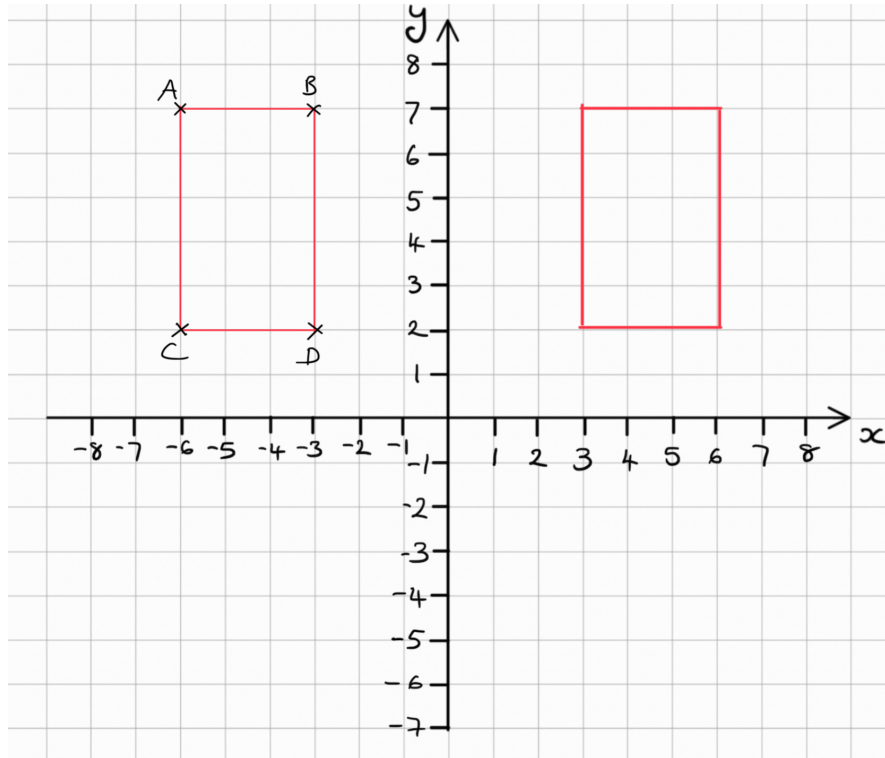
$$\begin{array}{r} 225 \\ \times 15 \\ \hline 1125 \\ 2250 \\ \hline 3375 \end{array}$$

(1000 to fill the box)

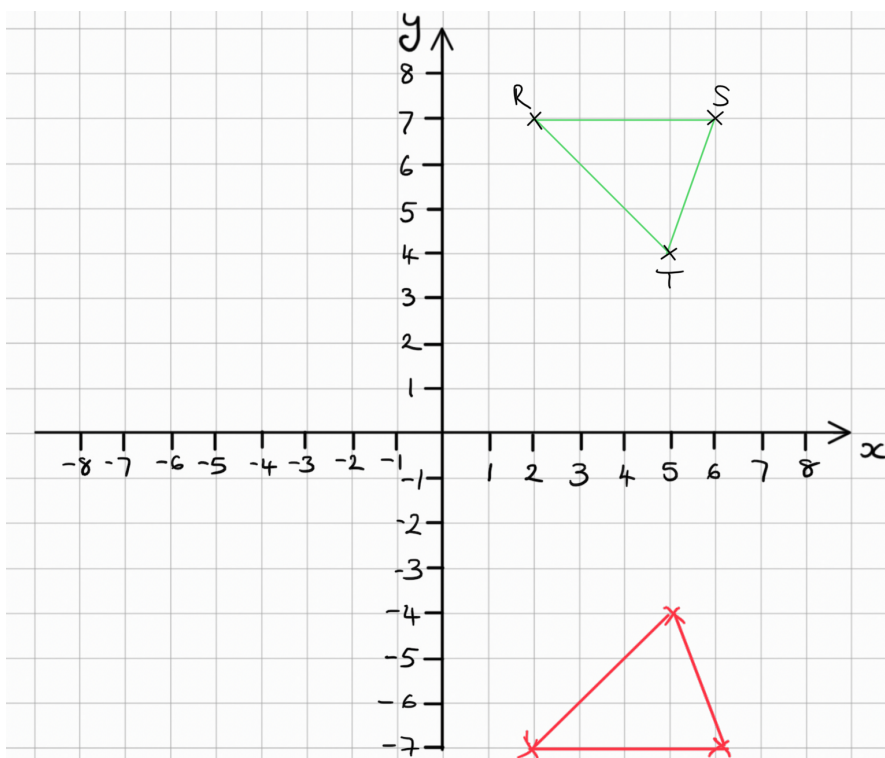
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Transformations & Symmetry

- 1 Draw on the following graph a reflection in the y-axis of shape ABCD.

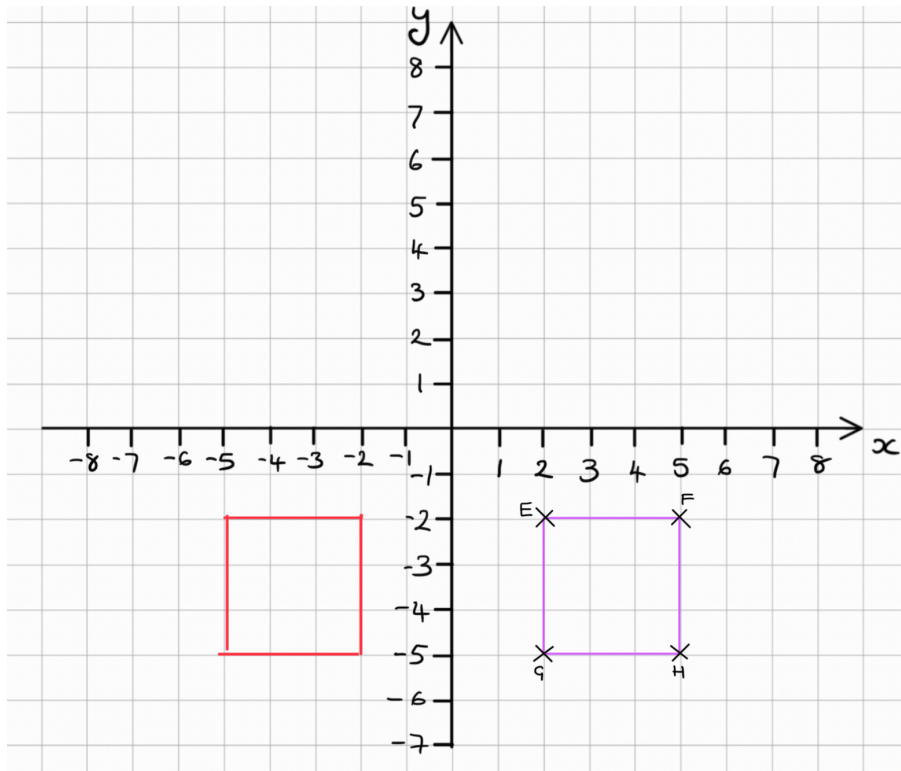


- 2 Draw on the following graph a reflection in the x-axis of shape RST.

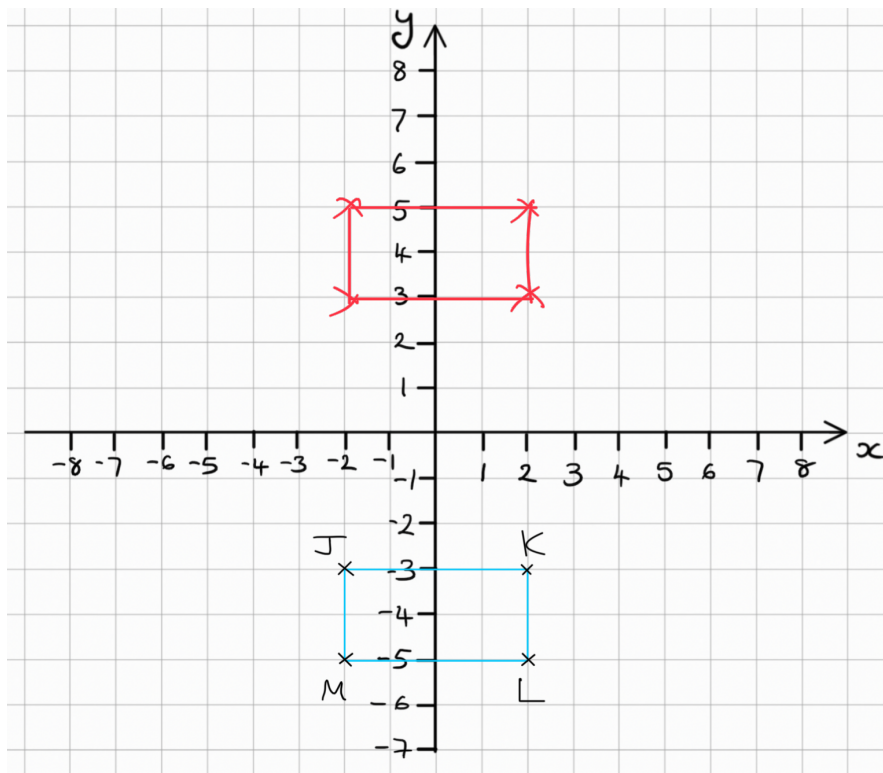


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- 3 Draw on the following graph a reflection in the y-axis of shape EFGH.

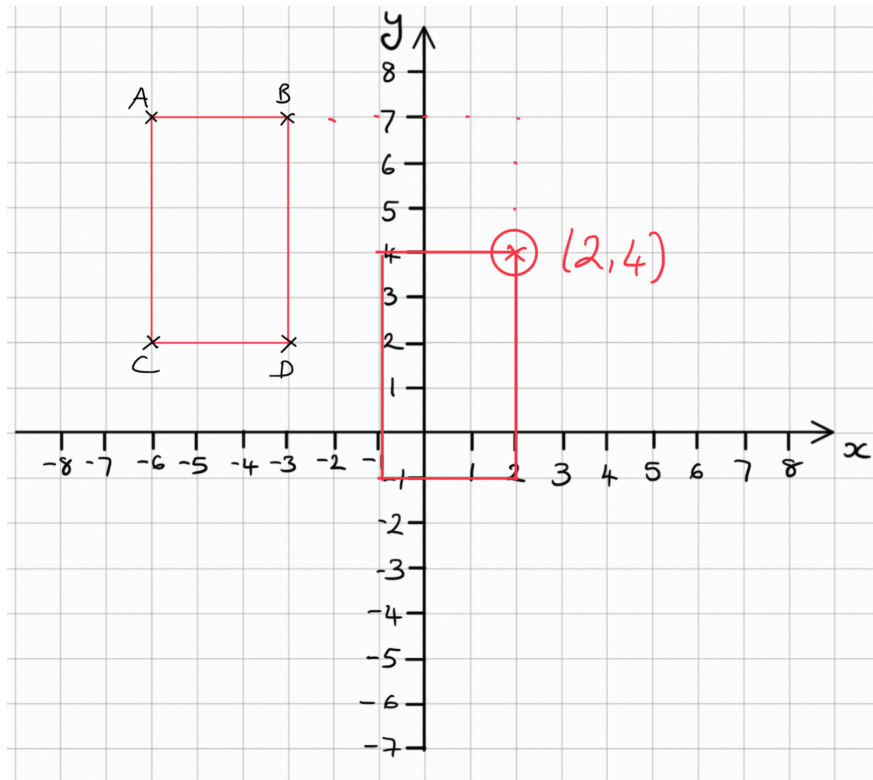


- 4 Draw on the following graph a reflection in the x-axis of shape JKLM.

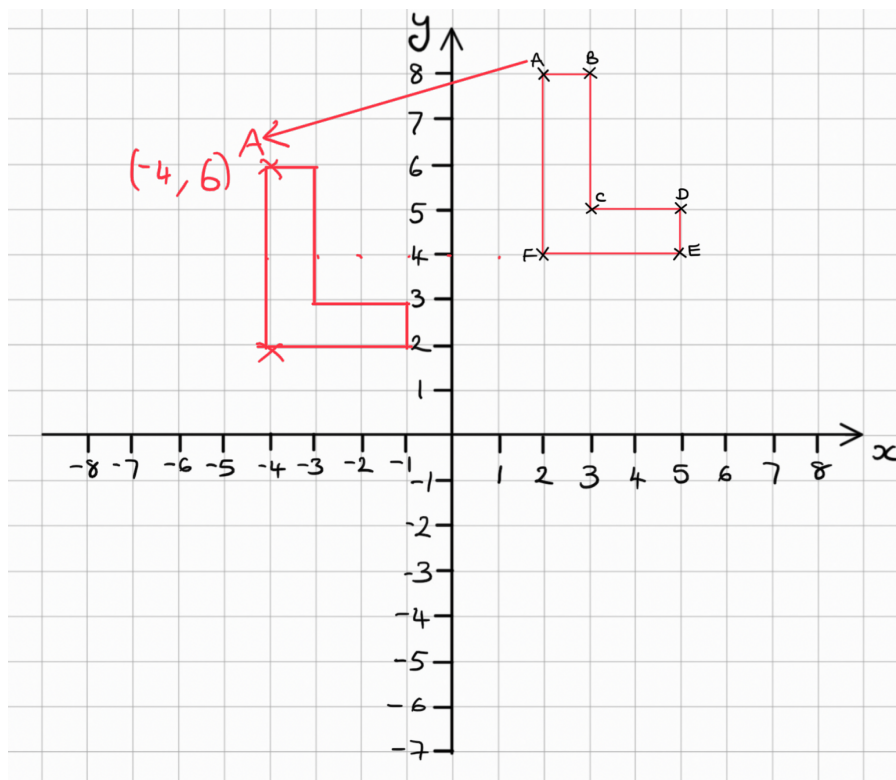


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- 5 Translate shape ABCD 5 to the right **and** 3 down. Will (2, 4) be one of the co-ordinates on the rectangle? *Yes*

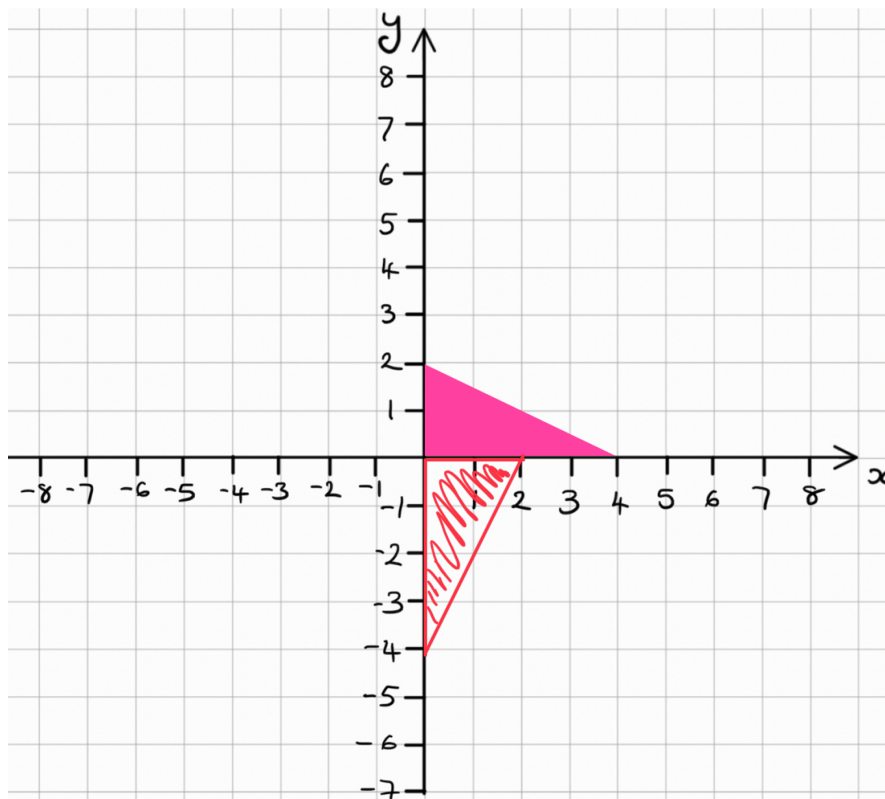


- 6 Translate shape ABCDEF 6 to the left and 2 down. What co-ordinates will point A move to? *(-4, 6)*

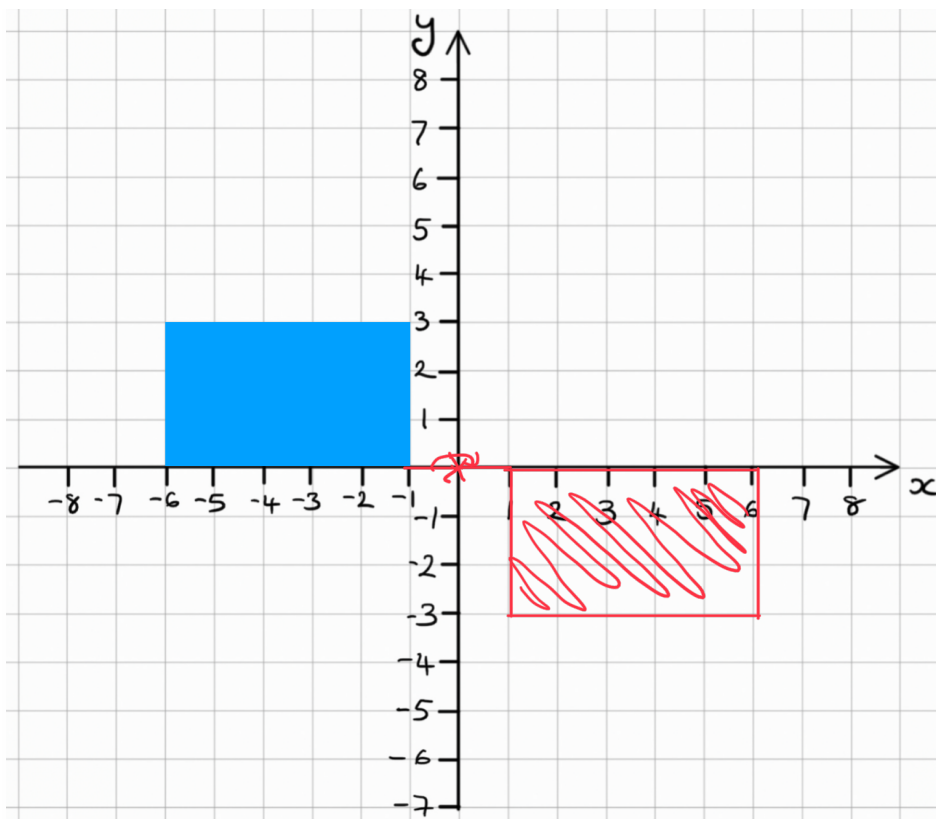


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- 7 Rotate the pink triangle 90° clockwise around the point $(0,0)$.

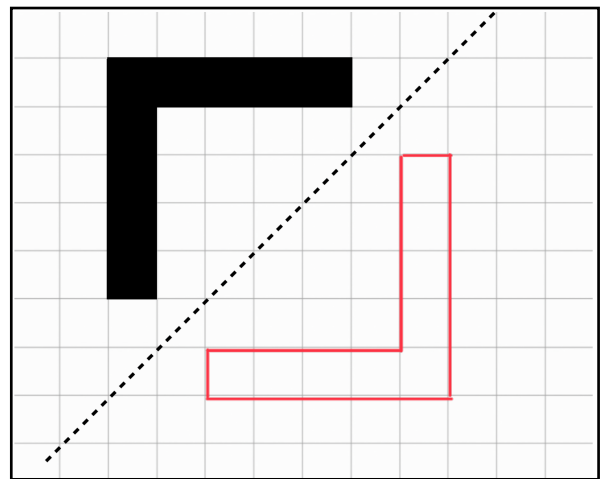
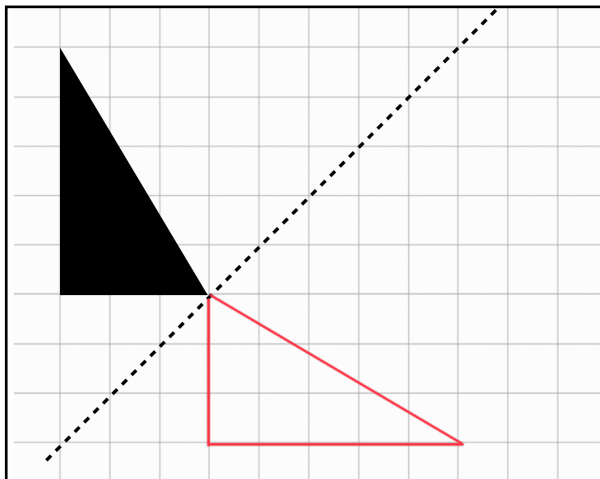
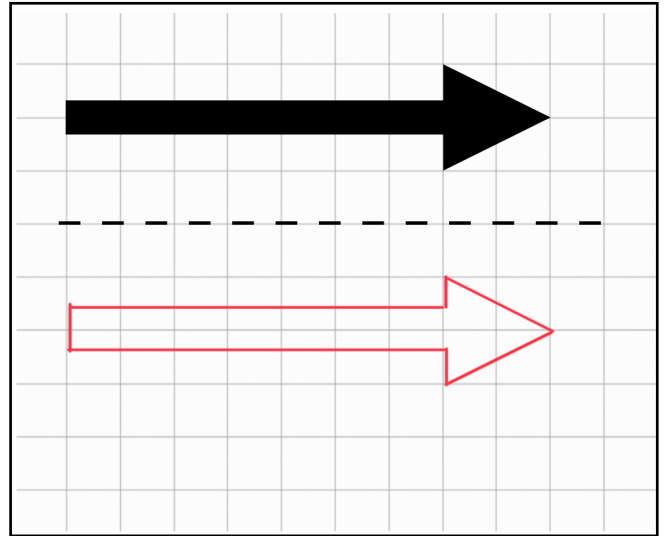
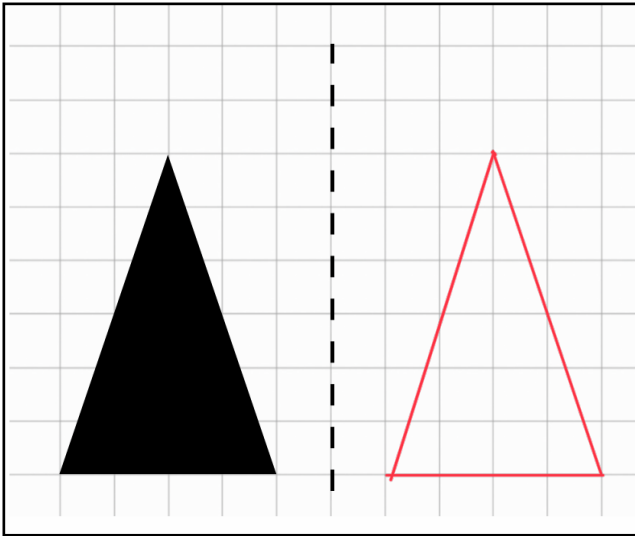


- 8 Rotate the blue rectangle 180° around the point $(0,0)$.



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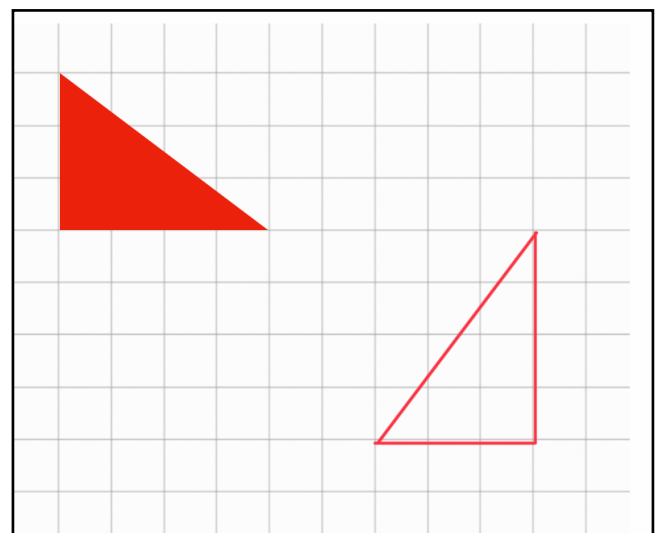
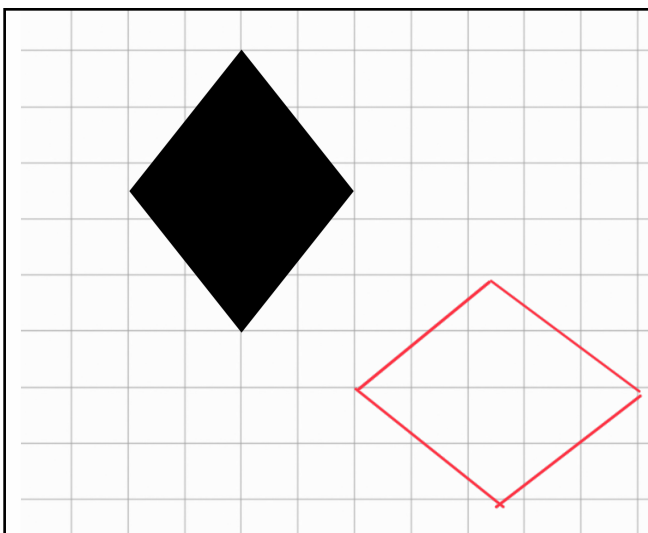
9 Reflect the following shapes in the mirror lines:



10 Rotate the following shapes by the number of degrees stated.

90° clockwise

90° anti-clockwise



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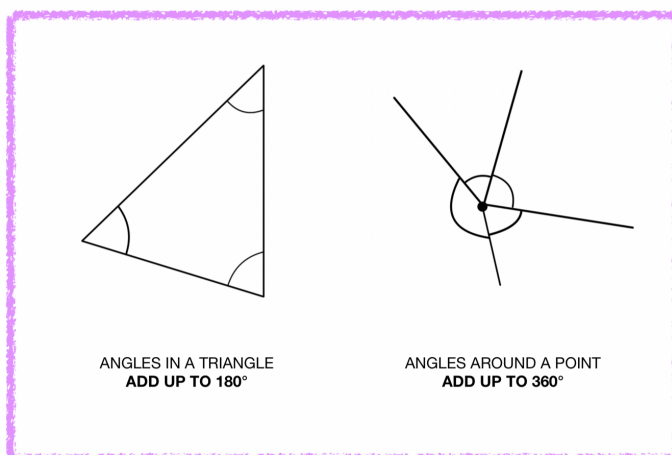
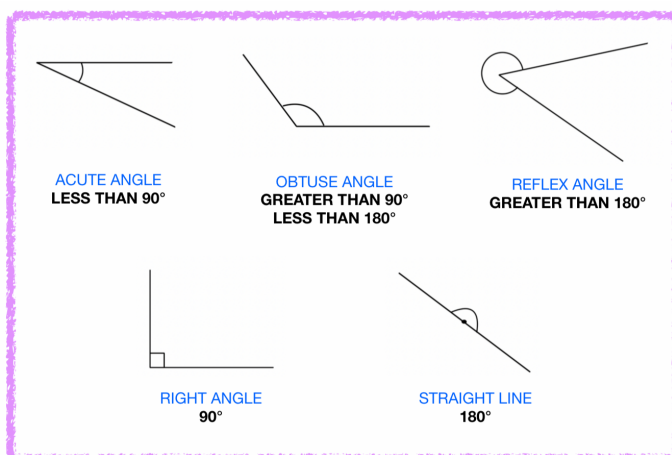
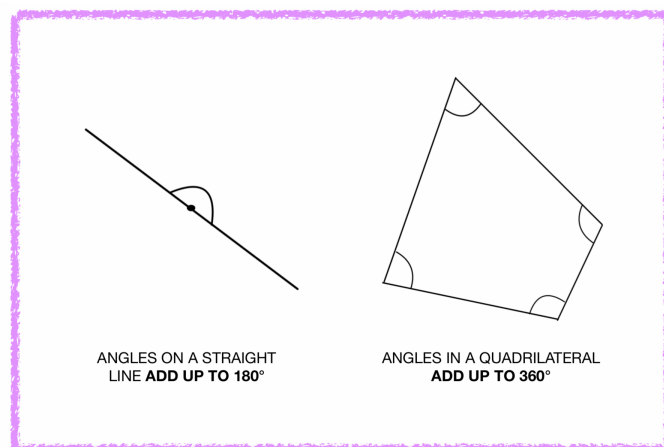
Key Facts For Starter

Fraction	Decimal	Percentage
$\frac{1}{2}$	0.5	50%
$\frac{1}{4}$	0.25	25%
$\frac{1}{5}$	0.2	20%
$\frac{1}{10}$	0.1	10%
$\frac{1}{100}$	0.01	1%
$\frac{1}{8}$	0.125	12.5%
$\frac{1}{3}$	$0.\dot{3}$	$33.\dot{3}\%$

Metric Units of Measure	Imperial Units of Measure
Length: 1 km = 1000m 1m = 100cm 1cm = 10mm Weight: 1 tonne = 1000kg 1 kg = 1000g 1g = 1000mg Capacity: 1 litre = 1000ml	Length: 1 mile = 1760 yards 1 yard (yd) = 3 feet 1 foot (ft) = 12 inches Weight: 1 stone = 14 pounds 1 pound (lb) = 16 ounces (oz) Capacity: 1 gallon = 8 pints

Approximate Equivalences (\approx means 'is approximately equal to')

Length: 8 km \approx 5 miles (1 mile \approx 1.6km) 1 yard \approx 90 cm 1 foot \approx 30 cm 1 inch \approx 2.5 cm Weight: 1 ounce (oz) \approx 30 grams (g) 1 kg \approx 2.2 pounds Capacity: 1 pint \approx 0.6 litre (l) 1 gallon \approx 4.5 litres



Months

30 days hath September, April, June, and November;
 All the rest have 31, Excepting February alone,
 And that has twenty-eight days clear, and twenty-nine in each leap year

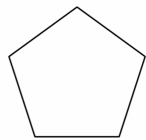
Time

1 millennium	=	1000 years
1 century	=	100 years
1 year	=	12 months = 52 weeks
1 week	=	7 days
1 day	=	24 hours
1 hour	=	60 minutes
1 minute	=	60 seconds

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Regular Polygons

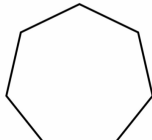
In a REGULAR polygon, ALL sides are EQUAL and ALL angles are EQUAL.



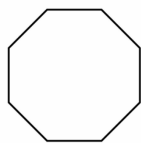
PENTAGON



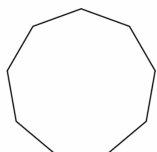
HEXAGON



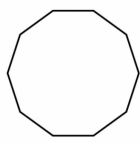
HEPTAGON



OCTAGON



NONAGON

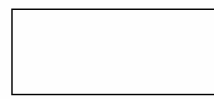


DECAGON

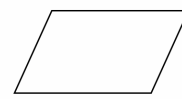
Quadrilaterals



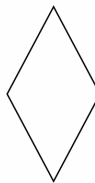
SQUARE
FOUR EQUAL SIDES
FOUR 90° ANGLES
FOUR LINES OF SYMMETRY



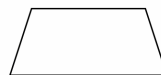
RECTANGLE
TWO PAIRS OF EQUAL SIDES
FOUR 90° ANGLES
TWO LINES OF SYMMETRY



PARALLELOGRAM
TWO PAIRS OF PARALLEL SIDES
TWO PAIRS OF EQUAL ANGLES
NO LINES OF SYMMETRY



RHOMBUS
FOUR EQUAL SIDES
TWO PAIRS OF EQUAL ANGLES
TWO LINES OF SYMMETRY



TRAPEZIUM
ONE PAIR OF PARALLEL LINES



KITE
TWO PAIRS OF SIDES WITH EQUAL LENGTH
ONE PAIR OF OPPOSITE EQUAL ANGLES
ONE LINE OF SYMMETRY

3D Shapes



Cube



Cuboid



Sphere



Square-based Pyramid



Cone



Triangular-based Pyramid (tetrahedron)



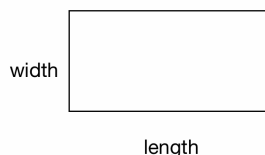
Cylinder



Prism

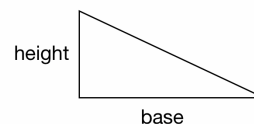
Area of Rectangle

$$A = \text{length} \times \text{width}$$



Area of Triangle

$$A = \frac{1}{2} \times \text{base} \times \text{height}$$



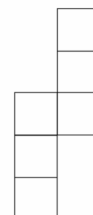
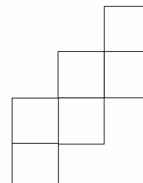
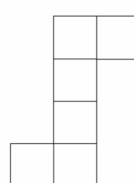
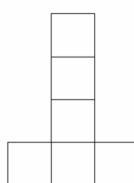
Prism



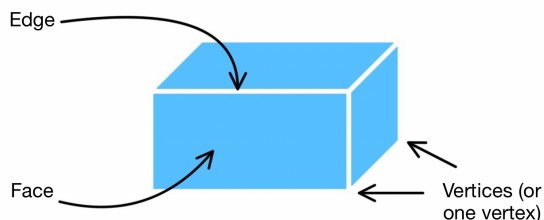
A **prism** has the same shape at both ends with rectangles joining them.
'If you slice the shape at any point between the two ends the shape in the middle is the same'.

Nets

A **net** can be folded up to make a 3D shape. The following are some of the nets that make up a **cube** and will all 'fold up' to make the same shape:



Faces, Edges & Vertices



Volume and Capacity

Volume is the amount of space a 3D object takes up. This is measured in cubic units such as cm^3 , m^3 and mm^3 .

$$\text{Volume of cuboid} = \text{length} \times \text{width} \times \text{height}$$

Capacity is the maximum amount of water a container can hold. This is measured in litres and millilitres (**l** and **ml**).