

### Key Language

1	<b>Ratio</b>	compares a part to another part
2	<b>Direct proportion</b>	as one amount increases, another increases at the same rate
3	<b>Inverse proportion</b>	when one value decreases at the same rate the other increases
4	<b>Speed</b>	How fast an object moves
5	<b>Distance</b>	How far something has travelled
6	<b>Time</b>	How long it has taken
7	<b>Density</b>	How tightly packed something is
8	<b>Rotational Symmetry</b>	the property a shape has when it looks the same after some rotation by a partial turn
9	<b>Order of rotational symmetry</b>	The number of times the shape appears exactly the same in one full turn
10	<b>Rotate (rotation)</b>	Turning a shape (angle, direction, centre of rotation)
11	<b>Translate</b>	Moving a shape from one place to another (vector)
12	<b>Enlarge</b>	Changing the size of a shape (scale factor, centre of enlargement)
13	<b>Scale Factor</b>	The multiplier used to change the size of a shape
14	<b>Similar</b>	Shapes that are an enlargement of each other (in proportion)
15	<b>Pie Chart</b>	A circular graph used for comparing proportions
16	<b>Stem and Leaf</b>	A plot where each data value is split into a "leaf" (usually the last digit) and a "stem" (the other digits)
17	<b>Mode (modal)</b>	Most popular group/item
18	<b>Mean</b>	Total divided by quantity
19	<b>Median</b>	Middle number (in order)
20	<b>Range (spread)</b>	Largest value subtract the smallest value

### Formulae to Learn

**Direct proportion**

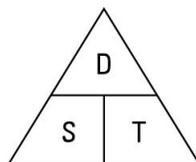
$$y = kx$$

k is a constant

**Inverse proportion**

$$y = \frac{k}{x}$$

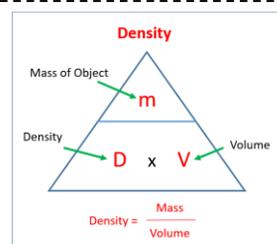
k is a constant



$$D = S \times T$$

$$S = D \div T$$

$$T = D \div S$$



Know

Angle for each pie chart sector =  $\frac{\text{total in sector} \times 360}{\text{total}}$

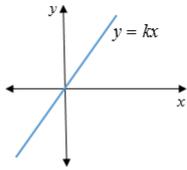
## More to Learn

### Direct and Inverse Proportion

#### Direct Proportion

$$y \propto x$$

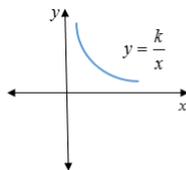
$$y = kx \text{ for a constant } k$$



#### Inverse Proportion

$$y \propto \frac{1}{x}$$

$$y = \frac{k}{x} \text{ for a constant } k$$



### Stem and Leaf:

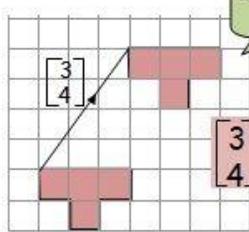
15, 16, 21, 23, 23, 26, 26, 30, 32, 41

Stem	Leaf
1	5 6
2	1 3 3 6 6
3	0 2
4	1

how to place "32"

## Notes Section:

### Translation



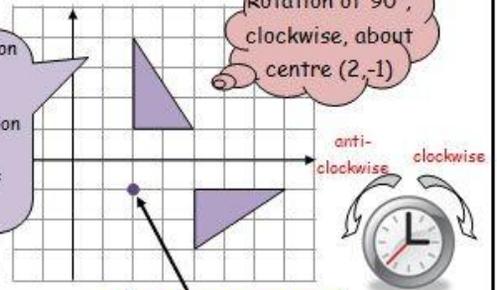
Describe with a vector

3 ← squares right  
4 ← squares up

### Rotation

To describe a rotation you need:

- the angle of rotation
- the direction
- the coordinates of the centre

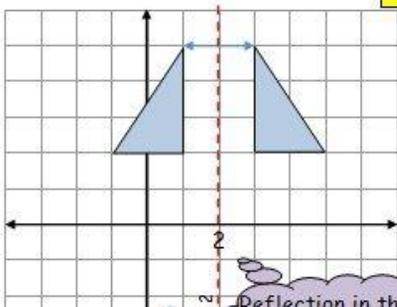


Rotation of  $90^\circ$ , clockwise, about centre (2, -1)



Centre of rotation

### Reflection



Reflection in the line  $x = 2$ .

Describe by naming the line of symmetry

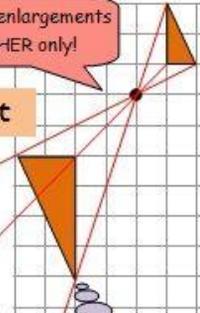
## Transformations

Centre

Enlargement, scale factor 3, centre (0, 7)

### Enlargement

Negative enlargements - HIGHER only!



Enlargement of scale factor -2

Always use **TRACING PAPER** for translation, reflection & rotation.

To describe an enlargement you need:

- the scale factor
- coordinates of the centre

Know

## PRACTICE QUESTIONS

1. What do we use to compare two or more parts together?
2. What do we call the relationship between two items where if one increases, the other increases at the same rate?
3. What do we call the relationship between two items where if one increases, the other decreases by the same rate?
4. How do we calculate speed?
5. How do we calculate distance?
6. How do we calculate time?
7. What word describes how tightly packed something is?
8. What do we call the property when a shape looks the same after being turned?
9. What do we call the number of times a shape appears the same during one whole turn?
10. What do we call turning a shape?
11. How do we describe a rotation?
12. How do we describe a translation?
13. What does a translation do?
14. What word describes changing the size of a shape?
15. What does a scale factor of 3 do?
16. If two shape are different sizes, but in the same proportion, how do we describe them?
17. What doesn't change when a shape is enlarged?
18. What type of graph is used to compare proportions?
19. In a stem and leaf plot, the tens become the 'stems' and the units the 'leaves'. What is the leaf for 50?
20. What is another word for mode?
21. Name three types of average?
22. What does the range tell us?

## ANSWERS

- |                                 |  |                           |
|---------------------------------|--|---------------------------|
| 1. Ratio                        | 11. Angle, direction, centre of rotation | 19. 0                     |
| 2. Direct proportion            | 12. Using a vector                       | 20. Modal                 |
| 3. Inverse proportion           | 13. Moves a shape                        | 21. Mean, Median and Mode |
| 4. Distance divided by time     | 14. Enlargement (enlarging)              | 22. Spread                |
| 5. Speed multiplied by time     | 15. Shape becomes 3 times larger         |                           |
| 6. Distance divided by speed    | 16. Similar                              |                           |
| 7. Density (dense)              | 17. Angles                               |                           |
| 8. Rotational Symmetry          | 18. Pie chart                            |                           |
| 9. Order of Rotational Symmetry |  |                           |
| 10. Rotation (rotate)           |  |                           |

