

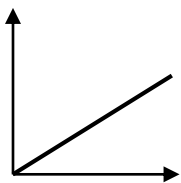
# Y10 Mathematics Knowledge Organiser

## FOUNDATION PART 2: Loci, Equations 1, Proportion

### Key Language

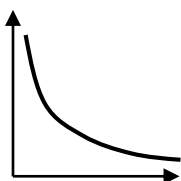
1	<b>construct</b>	Draw accurately (usually using a pair of compasses)
2	<b>arc</b>	A section of a curve (such as the curve you draw with compasses)
3	<b>perpendicular</b>	At right angles
4	<b>bisect</b>	Cut exactly in half (by construction)
5	<b>locus</b> (plural: <b>loci</b> )	A set of point which follow a rule (or rules)
6	<b>equidistant</b>	Equal distance
7	<b>linear</b>	Linked to a straight line on a graph
8	<b>point of intersection</b>	Co-ordinates where lines (or curves) meet
9	<b>solve</b>	Find the value (or values) of the unknown letter which make an equation true e.g. for $p^2 = 25$ the <b>solutions</b> are $p = 5$ and $p = -5$
10	<b>trial and improvement</b>	systematic method for estimating the solution to complex equations which can't easily be solved
11	<b>direct proportion</b>	Relationship between two quantities where: as one doubles, the other doubles (etc.)
12	<b>inverse proportion</b>	Relationship between two quantities where: as one doubles, the other halves (etc.)
13	<b>varies as</b>	Another way of saying 'is directly proportional to'
14	<b>varies inversely as</b>	Another way of saying 'is inversely proportional to'
15	<b>constant of proportionality</b>	The value connecting quantities which are in proportion, usually represented by ' $k$ '
16	<b>asymptote</b>	A line on a graph that the curve gets closer and closer to, but never reaches

### Proportion Graphs



#### Direct proportion

- Straight line
- Positive gradient
- Through the origin (0, 0)



#### Inverse proportion

- Curve (as shown)
- Both axes are asymptotes

Know



## Proportion Formulae

<u>Direct proportion</u>	write down first:	e.g. $y = kx$
	final formula:	e.g. $y = 5x$ , $A = 0.3 B$
<u>Inverse proportion</u>	write down first:	e.g. $y = \frac{k}{x}$
	final formula:	e.g. $y = \frac{5}{x}$ , $A = \frac{3}{10x}$

You should also recognise formulae for **inverse** proportion when they have been rearranged like this:  $xy = 5$ ,  $AB = 0.3$

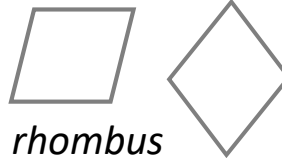
## Revision: Quadrilaterals

Make sure you know the names of these special quadrilaterals



*parallelogram*

(2 pairs of parallel sides)



*rhombus*

(2 pairs of equal parallel sides)



*trapezium*

(1 pair of parallel sides)

Know

## PRACTICE QUESTIONS

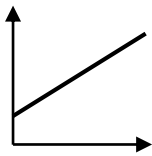
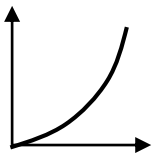
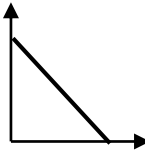
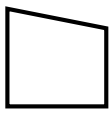

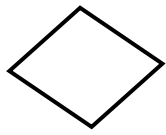
Ten of these questions will be chosen, with very little change, to make the Knowledge Test. If you can confidently answer all of these, you will pass easily.

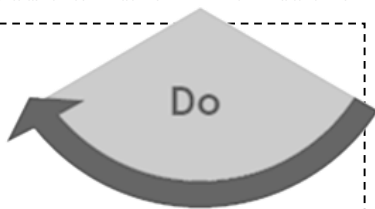
Use pages 1 and 2 to research and *learn* anything that you don't know yet.

1. What word do we use for a section of a curve?
2. What does the word *bisect* mean?
3. What is the plural of *locus*?
4. What does the word *equidistant* mean?
5. What does the word *perpendicular* mean?
6. What do we call the point where two lines (or curves) meet on a graph?
7. What do we call the systematic method we use to estimate the solution to a complex equation which can't easily be solved?
8. Variables  $x$  and  $y$  have a relationship where as one doubles, the other doubles. What do we call this type of proportion?

Do

## PRACTICE QUESTIONS (continued)

9. Variables  $p$  and  $q$  have a relationship where as one doubles, the other halves. What do we call this type of proportion?
10.  $A$  varies as  $B$ . What does this mean about  $A$  and  $B$ ?
11.  $g$  varies inversely as  $h$ . What does this mean about  $g$  and  $h$ ?
12.  $x$  and  $y$  are inversely proportional.  $y = \frac{9}{x}$   
What is the value of the *constant or proportionality*?
13.  $t$  is directly proportional to  $p$ . What equation would you write down first?
14. Which of these equations represents a *direct proportion*?
- A:  $h = \frac{3}{g}$       B:  $h = 3g$       C:  $gh = 3$
15. Which of these equations does **not** represent an *inverse proportion*?
- A:  $p = \frac{5}{q}$       B:  $pq = 5$       C:  $p = 5q$
16. How do you know that this graph does **not** show a direct proportion?
- 
17. How do you know that this graph does **not** show an inverse proportion?
- 
18. How do you know that this graph does **not** show an inverse proportion?
- 
19. What is the name of this shape?
- 
20. What is the name of this shape?
- 
21. What is the name of this shape?
- 



## ANSWERS

1. arc
2. cut in half
3. loci
4. the same distance, equal distance
5. at right angles,  
a line at right angles to another
6. point of intersection
7. trial and improvement
8. direct proportion
9. inverse proportion
10.  $A$  is directly proportional to  $B$
11.  $g$  is inversely proportional to  $h$
12. 9
13.  $t = kp$
14. B
15. C
16. It doesn't go through the origin
17. It isn't a straight line
18. It isn't a curve
19. trapezium
20. parallelogram
21. rhombus