Y10 Mathematics Knowledge Organiser

FOUNDATION PART 3: Formulae & Functions, Approximation, Graphs 1

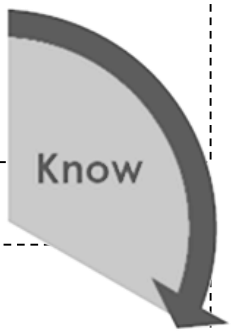
Key Language

1	**subject**	The letter at the start of a formula e.g. $t = 2b + c$, the subject is t
2	**in terms of**	The other letters in a formula e.g. $t = 2b + c$ is in terms of b and c
3	**isolate**	To get (a letter) on its own
4	**function**	A mathematical procedure e.g. 'multiply by 3'
5	**approximate answer**	An answer that is roughly correct, but not exact
6	**estimation**	The process of finding an approximate answer (usually by rounding each of the values in the calculation)
7	**truncate**	'chop off' a number e.g. 5.138 truncated to 2dp is 5.13
8	**error interval**	The range of values a number could have taken before being rounded or truncated
9	**upper bound**	The upper limit of the values a number could have taken before being rounded or truncated
10	**lower bound**	The lower limit of the values a number could have taken before being rounded or truncated
11	**product**	The result of multiplying e.g. the product of 3 and 4 is 12
12	**gradient**	A number representing the 'steepness' of a graph
13	**reciprocal**	1 divided by the number
14	**line segment**	A short section of a line

Gradient from a Graph

To find the gradient (m) from a graph,
we draw a triangle and use the formula:

$$m = \frac{change\ in\ y}{change\ in\ x}$$



Parallel and Perpendicular

Parallel lines have the same gradient.
Two lines are **perpendicular** if their gradients have a product of 1

e.g. $y = -4x + 2$ and $y = \frac{1}{4}x + 2$ are perpendicular because $-4 \times \frac{1}{4} = -1$

Gradient from Two Points

The line joining the points (x_1, y_1) and (x_2, y_2)
has gradient (m) given by:

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

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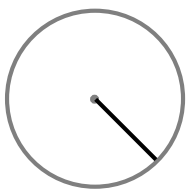
Notation for Recurring Decimals

Some examples…

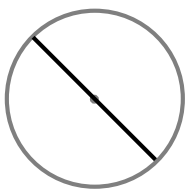
$0.\dot{5}$	means	0.5555…
$0.2\dot{5}$	means	0.2555…
$0.\dot{2}\dot{5}$	means	0.252525…
$0.\dot{2}1\dot{5}$	means	0.215215…

Revision: Parts of a Circle

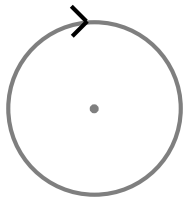
Make sure you know the names of these parts of a circle:



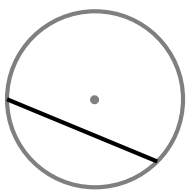
radius



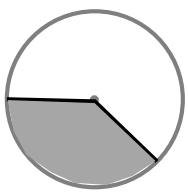
diameter



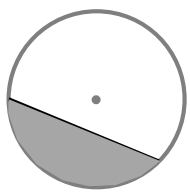
circumference



chord



sector



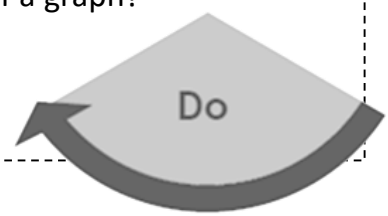
segment

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.

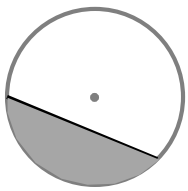
1. What word means the letter at the start of a formula?
2. What does the word *isolate* mean?
3. What word do we use for a mathematical procedure e.g. multiply by 3?
4. Explain what an *approximate* answer is.
5. What does *truncate* mean?
6. What does the word *product* mean in maths?
7. What does the word *reciprocal* mean?
8. What is a *line segment*?
9. What do we call the number that represents the 'steepness' of a graph?
10. In the formula $g = h + 2d$, what is the *subject*?
11. Which of these is a formula for y <u>in terms of x</u>?

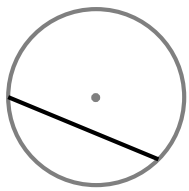
    A: $y = t + 5$ B: $x = y + 5$ C: $y = x + 5$

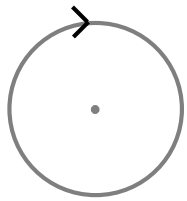


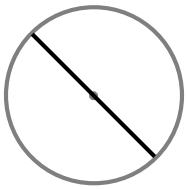
PRACTICE QUESTIONS (continued)

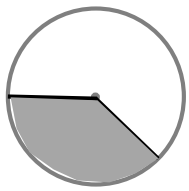
12. Which of these is a *function*?
    A: 5 + 7 = 12 B: $2x + 3x \equiv 5x$ C: $\div 8$
13. Write down the formula you would use to find the gradient from a graph.
14. Write down the formula you would use to find the gradient of the line segment joining the points (x_1, y_1) and (x_2, y_2).
15. What do you know about the gradients of parallel lines?
16. What do you know about the gradients of perpendicular lines?
17. Which of these means 0.383838… ?
    A: $0.3\dot{8}$ B: $0.\dot{3}8$ C: $0.\dot{3}\dot{8}$
18. Which of these means 0.511111… ?
    A: $0.5\dot{1}$ B: $0.\dot{5}1$ C: $0.\dot{5}\dot{1}$
19. Write 0.77777… using the correct notation for a recurring decimal.
20. Write 0.207207207… using the correct notation for a recurring decimal.
21. Write the name of each circle part:

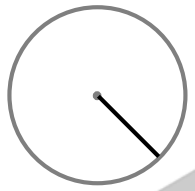
(a) 

(b) 

(c) 

(d) 

(e) 

(f) 

ANSWERS

1. Subject
2. Get (a letter) on its own
3. Function
4. An answer that is roughly correct, but not exact
5. 'chop off' (the end of a decimal number)
6. Multiply
7. 1 divided by the number
8. A short section of a line
9. Gradient
10. g
11. C: $y = x + 5$
12. C: $\div 8$
13. $m = \frac{change\ in\ y}{change\ in\ x}$
14. $m = \frac{y_2 - y_1}{x_2 - x_1}$
15. They are equal (the same)
16. Their product is -1
17. C: $0.\dot{3}\dot{8}$
18. A: $0.5\dot{1}$
19. $0.\dot{7}$
20. $0.\dot{2}0\dot{7}$
21.
    (a) segment
    (b) chord
    (c) circumference
    (d) diameter
    (e) sector
    (f) radius