

# Maths Knowledge Organiser

## YEAR 9 FOUNDATION – UNITS 6 to 10

### Key Language

1	<b>Bearing</b>	An angle measured clockwise with 0° facing North
2	<b>Perpendicular bisector</b>	A line that cuts another line in half at an angle of 90°
3	<b>Angle bisector</b>	A line that cuts an angle in half
4	<b>y = a</b>	A line on a graph parallel to the x-axis, cutting the y-axis at 'a'
5	<b>x = a</b>	A line on a graph parallel to the y-axis, cutting the x-axis at 'a'
6	<b>y = mx + c</b>	General equation of a straight line, m=gradient, c=y-intercept
7	<b>Gradient</b>	How steep a line is
8	<b>y-intercept</b>	Where the line crosses the y-axis
9	<b>Pie chart</b>	A circular graph used for comparing proportions
10	<b>Sector</b>	One section of a pie chart
11	<b>Frequency polygon</b>	A line graph connecting the midpoints of frequencies in data
12	<b>Stem and leaf diagram</b>	A plot where each data value is split into a "leaf" (usually the last digit) and a "stem" (the other digits)
13	<b>Key</b>	Describes what the 'stem' and 'leaves' represent
14	<b>Percentage multiplier</b>	A percentage converted to a decimal
15	<b>Simple Interest</b>	Extra amount calculated as a percentage of the original amount.
16	<b>Compound interest</b>	Where interest is calculated on both the amount borrowed plus previous interest.
17	<b>Expand</b>	Multiply to remove brackets
18	<b>Factorise</b>	Finding what to multiply to get an expression (re-write with brackets)
19	<b>Subject</b>	The single variable that everything else is equal to
20	<b>'in terms of'</b>	Include the identified terms in your answer

### Formulae to Learn

Gradient =  $\frac{\text{increase in } y}{\text{increase in } x}$  or  $\frac{\text{rise}}{\text{run}}$  or  $\frac{\text{height}}{\text{base}}$  or  $\frac{y_2 - y_1}{x_2 - x_1}$

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

Calculating a percentage change = original amount x percentage multiplier

Finding a percentage change =  $\frac{\text{new value} - \text{original value}}{\text{original value}} \times 100$

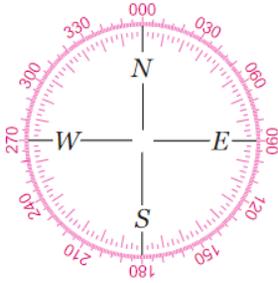


Know



## More to Learn

Bearings:



Stem and leaf: 15, 16, 21, 23, 23, 26, 26, 30, 32, 41

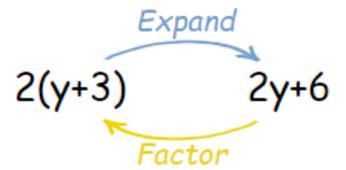
Stem	Leaf
1	5 6
2	1 3 3 6 6
3	0 2
4	1

how to place "32"

Inverse operations:

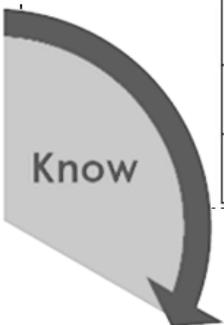
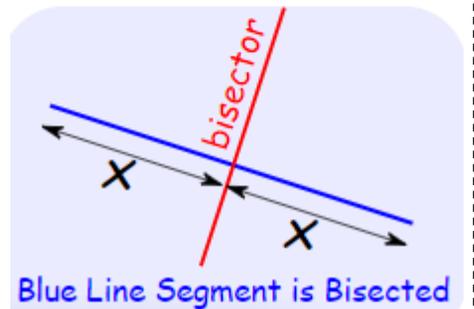
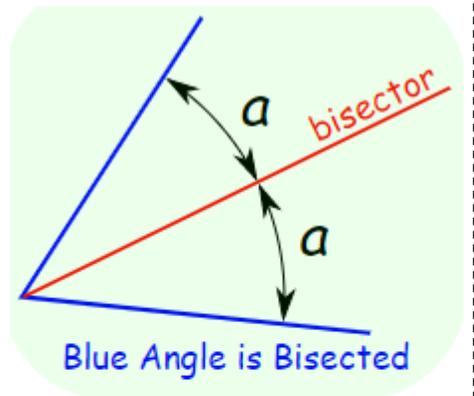
- Add  $\leftrightarrow$  Subtract
- Multiply  $\leftrightarrow$  Divide
- Square  $\leftrightarrow$  Square Root
- Cube  $\leftrightarrow$  Cube Root

Expand/Factorise:



## Notes Section:

Fraction	Decimal	Percentage
$\frac{1}{2}$	0.5	50%
$\frac{1}{4}$	0.25	25%
$\frac{1}{3}$	0.333333..... 0. $\dot{3}$	33. $\dot{3}$ %
$\frac{3}{4}$	0.75	75%
$\frac{1}{5}$	0.2	20%
$\frac{1}{10}$	0.1	10%



## PRACTICE QUESTIONS

1. What angles are measured with  $0^\circ$  at North?
2. What bearing is South?
3. What bearing is East?
4. What line cuts another line in half at  $90^\circ$ ?
5. What does an angle bisector do?
6. Which axis would  $x=3$  be parallel to?
7. Would  $y=7$  be horizontal or vertical?
8. What is the general form for the equation of a straight line?
9. What is another word for steepness?
10. What does 'c' represent in  $y = mx + c$ ?
11. Which gradient is steeper 3 or 5?
12. Which gradient is steeper 4 or -6?
13. Where would  $y = 3x + 4$  cross the y-axis?
14. What is the gradient of  $y = 2x - 5$ ?
15. What gradient produces a 'downhill' slope?
16. What graph compares proportions?
17. What is a section called in a pie chart?
18. What type of graph is a frequency polygon?
19. In a stem and leaf plot, the tens become the 'stems' and the units the 'leaves'. What is the leaf for 50?
20. Can you have decimals in a 'stem and leaf'?
21. What part of a stem and leaf plot describes what the numbers mean?
22. What is 50% as a decimal?
23. What is 75% as a decimal?
24. What is 3% as a decimal?
25. Does interest increase or decrease amounts?
26. What type of interest is just a percentage of the original amount?
27. What type of interest is calculated that includes previous interest?
28. What process is used to remove the brackets in  $3(x+5)$ ?
29. Expand  $3(x+5)$
30. What process shows what has been multiplied to get an expression?
31. What is the subject in  $x = 4a + b$ ?
32. What is the subject in  $3x-4y = z$
33. What words tell you to leave certain terms in your answer?

## ANSWERS

- |                       |                 |               |                           |
|-----------------------|-----------------|---------------|---------------------------|
| 1. Bearings           | 2. 180          | 3. 090        | 4. Perpendicular bisector |
| 5. Cuts angle in half | 6. y-axis       | 7. Horizontal | 8. $y = mx + c$           |
| 9. Gradient           | 10. y-intercept | 11. 5         | 12. -6                    |
| 13. (0,4)             | 14. 1           | 15. negative  | 16. Pie charts            |
| 17. Sector            | 18. Line        | 19. 0         | 20. yes                   |
| 21. Key               | 22. 0.5         | 23. 0.75      | 24. 0.03                  |
| 25. increase          | 26. simple      | 27. compound  | 28. expanding             |
| 29. $3x+15$           | 30. Factorising | 31. x         | 32. z                     |
| 33. 'in terms of'     |                 |               |                           |