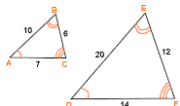
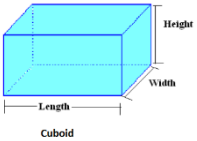




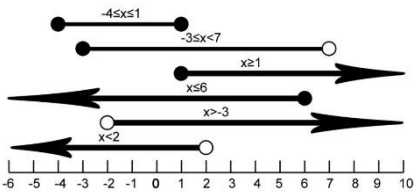
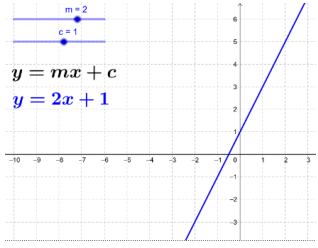
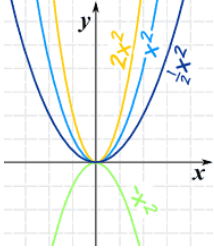

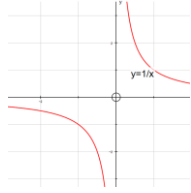
# YEAR 11 FOUNDATION

Knowledge Organisers

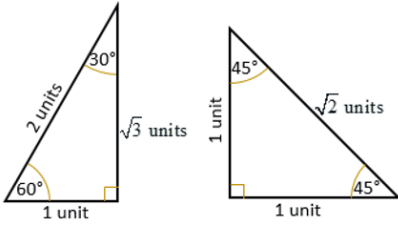
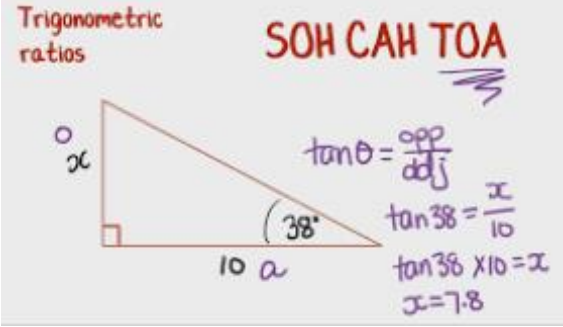
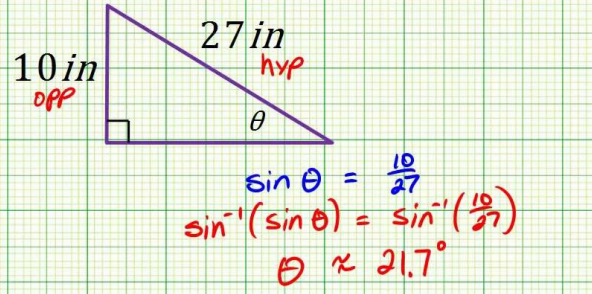
Year 11 Foundation Term 1

| Term |                                   | Definition  |
|------|-----------------------------------|---|
| 1    | Similar shapes                    | Two shapes that share the same angles, where one is an enlargement of the other.  |
| 2    | Scale Factor                      | What is the scale factor of enlargement from one shape to another?<br>Here, the scale factor is 2.<br>   |
| 3    | Volume of a cuboid                | Volume of a cuboid = length x width x height<br>   |
| 4    | Volume of a prism                 | Volume of a prism = area of cross section x length  |
| 5    | "In terms of pi"                  | This is when you leave your answer in "exact form."<br>E.g. $\pi \times 4^2 = 16\pi$<br>It is much better to leave it in this format as it will help at "A-Level" and gives the "exact" answer.   |
| 6    | Surds                             | A surd is a number left in "square root form." As decimals, they would go on forever which is why we leave them "in surd form."<br>E.g. $\sqrt{7}$ or $\sqrt{11}$ or $\sqrt{2}$ .<br>Non-example: $\sqrt{9}$ is not a surd as the answer is just 3. The decimals don't go on forever.   |
| 7    | Expanding a double bracket        | $(x + 5)(x + 2)$<br>This means multiply out both brackets.  |
| 8    | Factorising quadratic expressions | This is where you have a quadratic equation and you put it back into brackets.<br>$x^2 + 6x + 8 = 0$<br>$(x + \_)(x + \_) = 0$<br><small>Factors of 8</small><br><small>1, 8</small>  |
| 9    | Simplifying expressions           | Way of simplifying terms in expressions in which the variables are the same.<br>E.g. $3x + 2y + 5x + 2x + 5y = 10x + 7y$  |
| 10   | Sum                               | Another word for addition.  |
| 11   | Product                           | Another word for multiplication.  |
| 12   | Indices                           | The index of a number says how many times to use the number in a multiplication.<br>E.g.<br>$10^3$ means $10 \times 10 \times 10$ (10 multiplied by itself 3 times)<br>$2^5$ means $2 \times 2 \times 2 \times 2 \times 2$ (2 multiplied by itself 5 times)   |
| 13   | Re-arranging formulae             | This is where you change the subject of a formula.<br>E.g. Make x the subject of this formula ( $y = x + 10$ ).<br>It would become $x = y - 10$ .   |
| 14   | Equation                          | An equation is a mathematical statement that two things are equal in value. It consists of two expressions, one on each side on an equals sign.<br>E.g. $x + 3 = 10$  |
| 15   | Identity                          | An equation that no matter what values are chosen, it will always be true.<br>It is usually given with a triple equals sign ( $\equiv$ )<br>For example, $x + x \equiv 2x$ . This will always be true no matter what value of x you use.<br>For example, $y \times y \equiv y^2$ will always be true no matter what value of y is chosen. |
| 16   | Functions                         | Inputs and outputs  |
| 17   | Difference of two squares         | $(x + 5)(x - 5)$  |

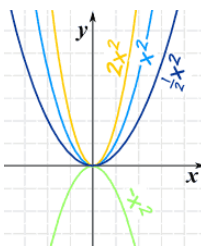
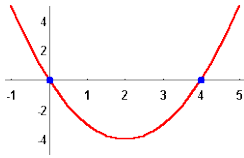
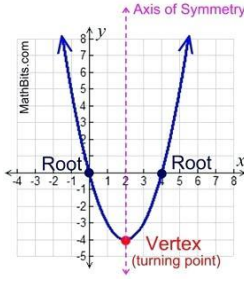
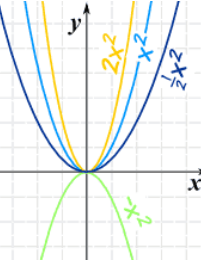
Year 11 Foundation Term 2


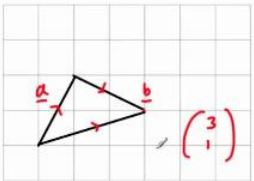
| Term | Definition  |
|------|---|
| 1    | <p>Inequality</p> <p>An inequality says that two values are not equal, or that one value is greater/less than another value. They are represented in maths by these symbols:<br/> <math>&lt;</math> <math>&gt;</math> or <math>\leq</math> <math>\geq</math></p>  |
| 2    | <p>Inequality on a number line</p> <p>Hollow circles (<math>&lt;</math> or <math>&gt;</math>)<br/>           Coloured-in circles (<math>\leq</math> or <math>\geq</math>)</p>    |
| 3    | <p>Solve equation with unknown on both sides</p> <p>Take away the smaller "x" from both sides.<br/>           E.g.<br/> <math>7x + 2 = 3x + 10</math><br/> <math>(-3x) \quad (-3x)</math><br/> <math>4x + 2 = 10</math><br/> <math>(-2) \quad (-2)</math><br/> <math>4x = 8</math><br/> <math>(\div 4) \quad (\div 4)</math><br/> <math>x = 2</math></p>            |
| 4    | <p>Expression</p> <p>An algebraic expression involves letter that represent numbers. They do not have an equals sign. For example, <math>a</math> or <math>6b</math> or <math>x^2 + y^2 + z^2</math> are all expressions.</p>   |
| 5    | <p>Formula</p> <p>A set of instructions for working something out. For example, <math>s = 4t + 3</math> is a formula for <math>S</math>. It shows you how to find <math>s</math> assuming you know what <math>t</math> is.</p>  |
| 6    | <p>Simultaneous equations</p> <p>Equations involving two or more unknowns that are to have the same values in each equation.</p> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin-left: auto;"> <math>(1) 3x + 4y = 24 \quad (1) \times 3</math><br/> <math>(2) 4x + 3y = 22 \quad (2) \times 4</math><br/> <math>y = 12</math> </div> |
| 7    | <p>Linear graphs</p> <p>A straight line graph that always takes the form <math>y = mx + c</math></p> <p><math>M</math> represents the gradient of the line.<br/> <math>C</math> represents the Y-intercept of the line.</p>    |
| 8    | <p>Quadratic graph</p> <p>A quadratic graph is a symmetrical, curved graph.<br/> <b>Hint:</b><br/>           Positive quadratics are similar to smiley faces.<br/>           Negative quadratics are similar to sad faces.</p>   |
| 9    | <p>Cubic graph</p> <p>A cubic graph (where the highest power is <math>x^3</math>) looks like the graph below:</p>    |
| 10   | <p>Reciprocal (<math>y = 1/x</math>) graph</p>   |

Year 11 Foundation Term 3

|     | Term                            | Definition  |                      |     |     |     |     |               |                      |                      |     |                      |                      |               |     |                      |   |            |
|-----|---------------------------------|---|----------------------|-----|-----|-----|-----|---------------|----------------------|----------------------|-----|----------------------|----------------------|---------------|-----|----------------------|---|------------|
| 1   | Direct proportion               | When one thing increases, the other increases at the same rate each time and vice versa.  |                      |     |     |     |     |               |                      |                      |     |                      |                      |               |     |                      |   |            |
| 2   | Inverse proportion              | When one thing increases, the other decreases at the same rate each time and vice versa.  |                      |     |     |     |     |               |                      |                      |     |                      |                      |               |     |                      |   |            |
| 3   | Trigonometry                    | The branch of maths that deals with the relationships between the sides and angles of triangles.<br><b>Hint:</b> You will have been taught this using the acronym (SohCahToa).  |                      |     |     |     |     |               |                      |                      |     |                      |                      |               |     |                      |   |            |
| 4   | Exact trigonometry values       |  <table border="1" data-bbox="676 680 924 920"> <thead> <tr> <th></th> <th>30°</th> <th>45°</th> <th>60°</th> </tr> </thead> <tbody> <tr> <td>sin</td> <td><math>\frac{1}{2}</math></td> <td><math>\frac{1}{\sqrt{2}}</math></td> <td><math>\frac{\sqrt{3}}{2}</math></td> </tr> <tr> <td>cos</td> <td><math>\frac{\sqrt{3}}{2}</math></td> <td><math>\frac{1}{\sqrt{2}}</math></td> <td><math>\frac{1}{2}</math></td> </tr> <tr> <td>tan</td> <td><math>\frac{1}{\sqrt{3}}</math></td> <td>1</td> <td><math>\sqrt{3}</math></td> </tr> </tbody> </table> |                      | 30° | 45° | 60° | sin | $\frac{1}{2}$ | $\frac{1}{\sqrt{2}}$ | $\frac{\sqrt{3}}{2}$ | cos | $\frac{\sqrt{3}}{2}$ | $\frac{1}{\sqrt{2}}$ | $\frac{1}{2}$ | tan | $\frac{1}{\sqrt{3}}$ | 1 | $\sqrt{3}$ |
|     | 30°                             | 45°   | 60°                  |     |     |     |     |               |                      |                      |     |                      |                      |               |     |                      |   |            |
| sin | $\frac{1}{2}$                   | $\frac{1}{\sqrt{2}}$  | $\frac{\sqrt{3}}{2}$ |     |     |     |     |               |                      |                      |     |                      |                      |               |     |                      |   |            |
| cos | $\frac{\sqrt{3}}{2}$            | $\frac{1}{\sqrt{2}}$  | $\frac{1}{2}$        |     |     |     |     |               |                      |                      |     |                      |                      |               |     |                      |   |            |
| tan | $\frac{1}{\sqrt{3}}$            | 1   | $\sqrt{3}$           |     |     |     |     |               |                      |                      |     |                      |                      |               |     |                      |   |            |
| 5   | Hypotenuse                      | The longest side of a right-angled triangle. It is opposite the right angle.  |                      |     |     |     |     |               |                      |                      |     |                      |                      |               |     |                      |   |            |
| 6   | Adjacent                        | The side labelled "Adjacent" should be labelled last and is the one that is left after labelling the Hypotenuse then the Opposite   |                      |     |     |     |     |               |                      |                      |     |                      |                      |               |     |                      |   |            |
| 7   | Opposite                        | The side labelled "Opposite" is the side opposite the angle given to you.   |                      |     |     |     |     |               |                      |                      |     |                      |                      |               |     |                      |   |            |
| 8   | Trigonometry (finding a length) |   |                      |     |     |     |     |               |                      |                      |     |                      |                      |               |     |                      |   |            |
| 9   | Trigonometry (finding an angle) |   |                      |     |     |     |     |               |                      |                      |     |                      |                      |               |     |                      |   |            |

Year 11 Foundation Term 4

| Term | Definition                   |   |
|------|------------------------------|---|
| 1    | Quadratic equation           | An equation where the highest power is $x^2$ .<br>E.g. $x^2 + 5x + 6$   |
| 2    | Factorising a quadratic      | This is where you have a quadratic equation and you put it back into brackets.<br>$x^2+6x+8=0$<br>$(x+4)(x+2)=0$<br>Factors of 8<br>1,8   |
| 3    | Quadratic graph              | A quadratic graph is a symmetrical, curved graph.<br><b>Hint:</b><br>Positive quadratics are similar to smiley faces.<br>Negative quadratics are similar to sad faces.<br>       |
| 4    | Roots                        | The roots of a quadratic equation are where the quadratic crosses the x-axis.<br>  |
| 5    | Turning Point of a quadratic | The “turning point” of a quadratic is the minimum or maximum value the curve takes.<br>   |
| 6    | Y-intercept                  | The y-intercept is where a line (curved or straight) crosses the y axis.  |
| 7    | Symmetry of a quadratic.     | A quadratic graph is a symmetrical, curved graph.<br><b>Hint:</b><br>Positive quadratics are similar to smiley faces.<br><br>Negative quadratics are similar to sad faces.<br> |
| 8    | Compound interest            | Compound interest is interested calculated on the original amount invested, as well as on top of any interested accumulated over time.  |
| 9    | Multiplier                   | A number you can multiply by to do percentage increase or decrease in one step.<br>E.g. Increase by 7% = Multiply by 1.07<br>Decrease by 8% = Multiply by 0.92  |

|   | Term    | Definition  |
|---|---------|---|
| 1 | Vectors | <p>A quantity which has a direction as well as a magnitude.<br/>                     You need to be able to draw vectors, add and subtract them.<br/>                     For example,</p> <div style="display: flex; justify-content: space-between; align-items: flex-start;"> <div style="width: 45%;"> <p style="text-align: center;"><br/>Corbett Maths</p> <p><math>\mathbf{a} = \begin{pmatrix} 1 \\ 2 \end{pmatrix}</math>   <math>\mathbf{b} = \begin{pmatrix} 2 \\ -1 \end{pmatrix}</math></p> <br/> <p><math>\mathbf{a} + \mathbf{b} = \begin{pmatrix} 3 \\ 1 \end{pmatrix}</math></p> </div> <div style="width: 45%; text-align: right;"> <p><b>Column Vectors</b></p>  </div> </div> |