

Topic/Skill	Definition/Tips	Example
1. Iteration	<p>The act of <b>repeating a process</b> over and over again, often with the aim of <b>approximating</b> a desired result more closely.</p> <p><b>Recursive</b> Notation: <math>x_{n+1} = \sqrt{3x_n + 6}</math></p>	$x_1 = 4$ $x_2 = \sqrt{3 \times 4 + 6} = 4.242640 \dots$ $x_3 = \sqrt{3 \times 4.242640 \dots + 6}$ $= 4.357576 \dots$
2. Iterative Method	<p>To create an iterative formula, <b>rearrange</b> an equation with more than one <math>x</math> term to <b>make one of the <math>x</math> terms the subject</b>.</p> <p>You will be given the first value to substitute in, often called <math>x_1</math>.</p> <p><b>Keep substituting in your previous answer</b> until your answers are the same to a certain degree of accuracy. This is called converging to a limit.</p> <p>Use the 'ANS' button on your calculator to keep substituting in the previous answer.</p>	<p>Use an iterative formula to find the positive root of <math>x^2 - 3x - 6 = 0</math> to 3 decimal places.</p> $x_1 = 4$ <p>Answer:</p> $x^2 = 3x + 6$ $x = \sqrt{3x + 6}$ <p>So <math>x_{n+1} = \sqrt{3x_n + 6}</math></p> $x_1 = 4$ $x_2 = \sqrt{3 \times 4 + 6} = 4.242640 \dots$ $x_3 = \sqrt{3 \times 4.242640 \dots + 6}$ $= 4.357576 \dots$ <p>Keep repeating...</p> $x_7 = 4.372068.. = 4.372 \text{ (3dp)}$ $x_8 = 4.372208 \dots = 4.372 \text{ (3dp)}$ <p>So answer is <math>x = 4.372 \text{ (3dp)}</math></p>