

1 Completing the square

- a) Write $5 + 8x - 2x^2$ in the form $a - b(x - c)^2$.
- b) Hence find the values of k for which $5 + 8x - 2x^2 = k$ has two solutions.



2 Completing the square

- a) Write $4x^2 + 12x + 1$ in the form $(ax + b)^2 + c$.
- b) Hence solve $4x^2 + 12x + 1 = 0$. Give your answers in simplified surd form.



3 Iteration

- a) Use $x_{n+1} = 4 + \frac{3}{x_n^2}$ with $x_0 = 4$ to find x_1, x_2 and x_3 to 4 decimal places.
- b) Show that the solution of $x^3 - 4x^2 - 3 = 0$ is 4.17 to 2 decimal places.



4 Iteration

The iteration $x_{n+1} = \sqrt{(k - \frac{4}{x_n})}$ with $x_0 = 2$ gives $x_1 = 3$.

- a) Find the value of k .
- b) Find the equation it solves, in the form $x^3 + ax + b = 0$.

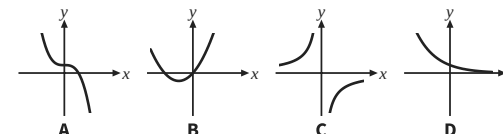


More graphs and equations

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5 Recognising graphs

- a) Match each equation to its graph: $y = 0.5^x$ $y = 1 - x^3$
 $y = x^2 + 2x$ $y = -\frac{3}{x}$
- b) For which two does y always decrease as x increases?

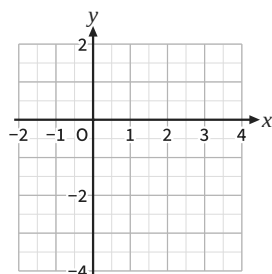


6 Plotting quadratic graphs

- a) Complete the table for $y = \frac{1}{2}x^2 - x - 3$.

x	-2	-1	0	1	2	3	4
y	1		-3		-3		

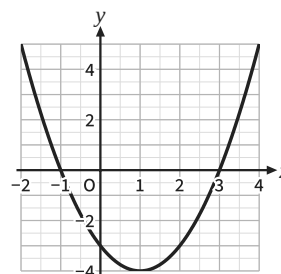
- b) Draw the graph. Use it to solve $x^2 - 2x - 6 = 0$.



7 Plotting quadratic graphs

The graph of $y = x^2 - 2x - 3$ is drawn.

- a) Use it to solve $x^2 - 2x \leq 3$.
- b) Find the values of k for which $x^2 - 2x - 3 = k$ has two positive solutions.



8 Roots and turning points

A quadratic curve has turning point $(3, -8)$ and crosses the x axis at $(5, 0)$.

- a) Write down the other point where it crosses the x axis.
- b) Find where it crosses the y axis.

