

1 Completing the square

- a) Write $x^2 - 8x + 3$ in the form $(x + p)^2 + q$.
b) Hence solve $x^2 - 8x + 3 = 0$. Give your answers as surds.



2 Completing the square

- a) Write $2x^2 + 12x + 23$ in the form $a(x + b)^2 + c$.
b) Use your answer to explain why $2x^2 + 12x + 23 = 0$ has no solutions.



3 Iteration

- a) Show that $x^3 + 5x = 9$ has a solution between 1 and 2.
b) Show that $x^3 + 5x = 9$ can be rearranged to give $x = \frac{9}{x^2 + 5}$.



4 Iteration

- a) Use $x_{n+1} = \frac{9}{x_n^2 + 5}$ with $x_0 = 1.5$ to find x_1, x_2 and x_3 to 4 decimal places.
b) Show that the solution of $x^3 + 5x = 9$ is 1.3 to 1 decimal place.



More graphs and equations

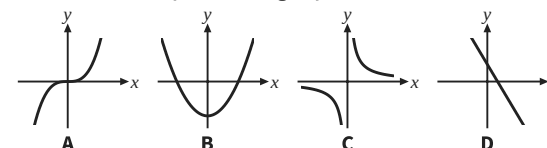
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5 Recognising graphs

- a) Match each equation to its graph: $y = x^3$ $y = 2 - 3x$
 $y = x^2 - 4$ $y = \frac{1}{x}$
b) Find where the quadratic graph crosses the x axis.

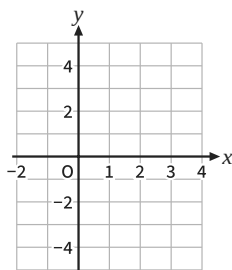


6 Plotting quadratic graphs

- a) Complete the table for $y = x^2 - 2x - 4$.

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

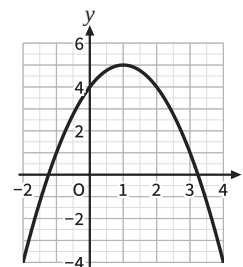
- b) Draw the graph on the grid.



7 Plotting quadratic graphs

The graph of $y = 4 + 2x - x^2$ is drawn.

- a) Estimate the solutions of $4 + 2x - x^2 = 0$.
b) Draw a straight line to estimate the solutions of $3 + x - x^2 = 0$.



8 Roots and turning points

The graph of $y = x^2 - 2x - 8$ is a curve.

- a) Find the coordinates of the points where it crosses the x axis.
b) Use your answer to find the coordinates of its turning point.

