# Simultaneous Equations and Graphs

Examples:

1a. On the same axes, draw the graphs of $2x + y = 3$ and

$y = x^2 - 3x + 1$

1b. Use your graph to write down the solutions to the simultaneous equations

1c. What algebraic method could we have used to show the graphs would have intersected twice?

## Example 2

a) On the same axes, draw the graphs of:

$$y = 2x - 2 \qquad y = x^2 + 4x + 1$$

b) Prove algebraically that the lines never meet

Question: The line with equation $y = 2x + 1$ meets the curve with equation $kx^2 + 2y + (k - 2) = 0$ at exactly one point. Given that $k$ is a positive constant:

a) Find the value of $k$.

b) For this value of $k$, find the coordinates of this point of intersection