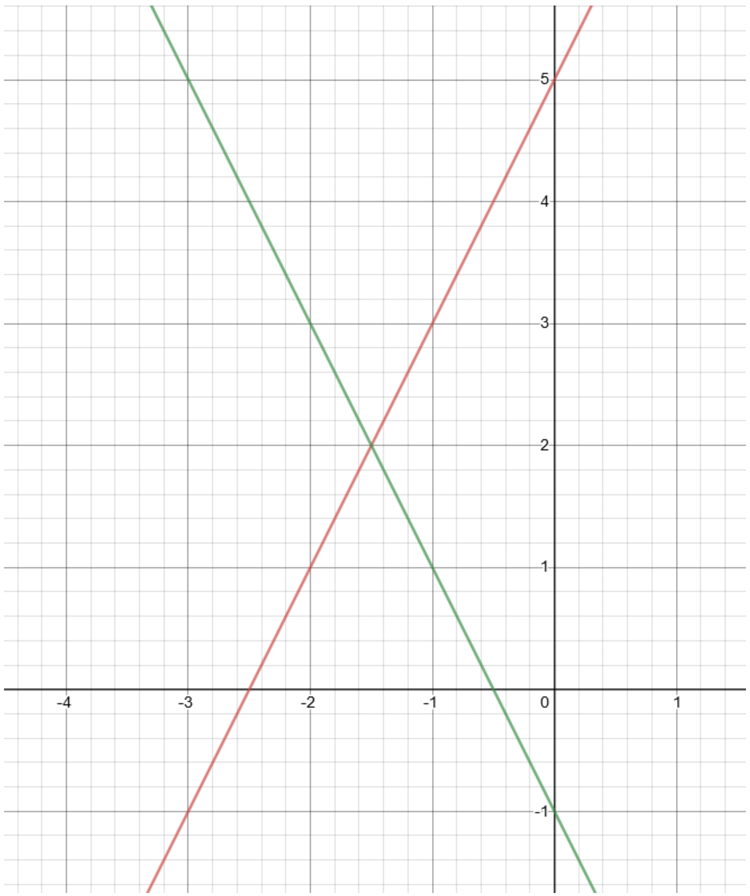
3.3) Simultaneous equations on graphs

Worked example

Solve:

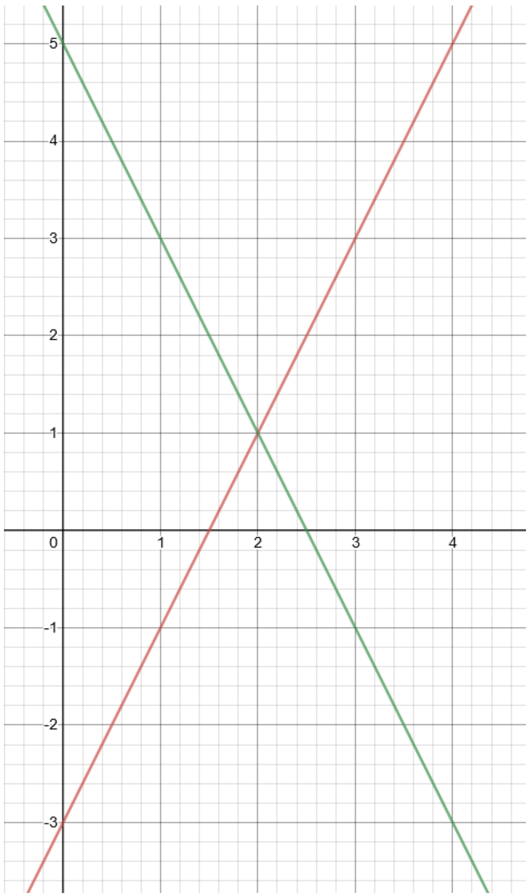
$$y = 2x + 5$$
$$y = -2x - 1$$



Your turn

Solve:

$$y = 2x - 3$$
$$y = -2x + 5$$

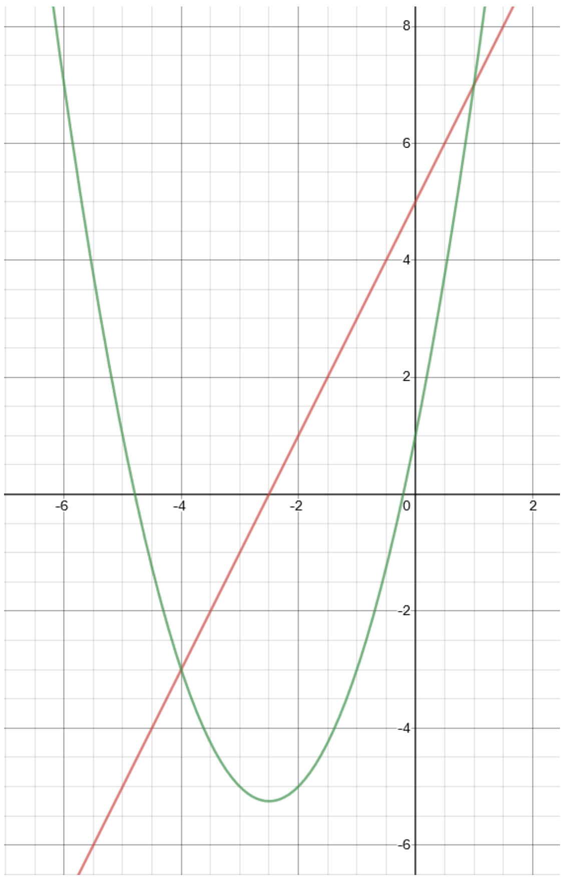


$$x = 2, y = 1$$

Worked example

Solve:

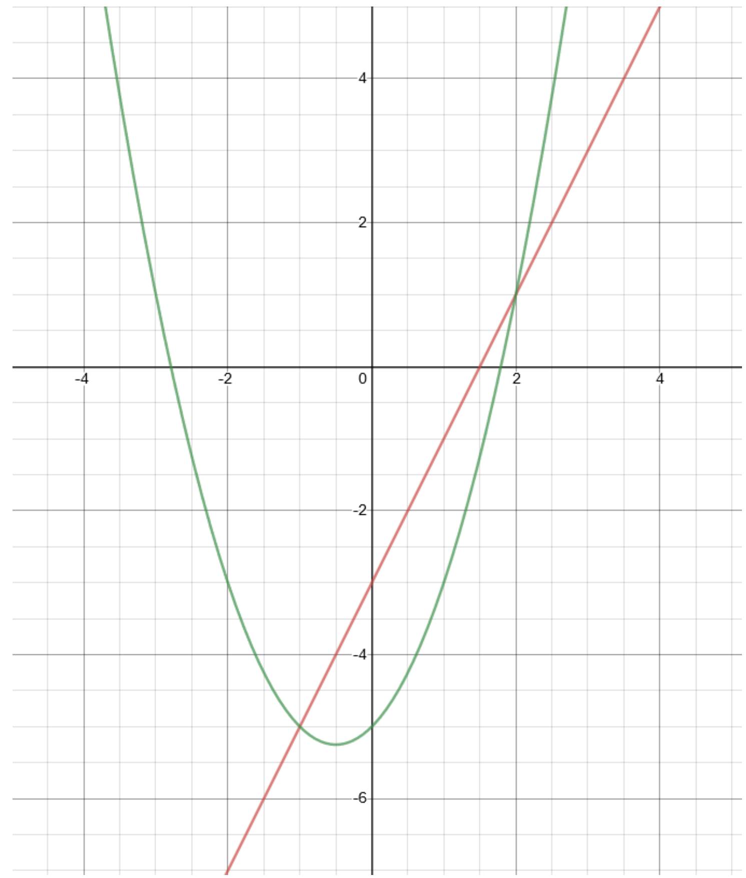
$$y = 2x + 5$$
$$y = x^2 + 5x + 1$$



Your turn

Solve:

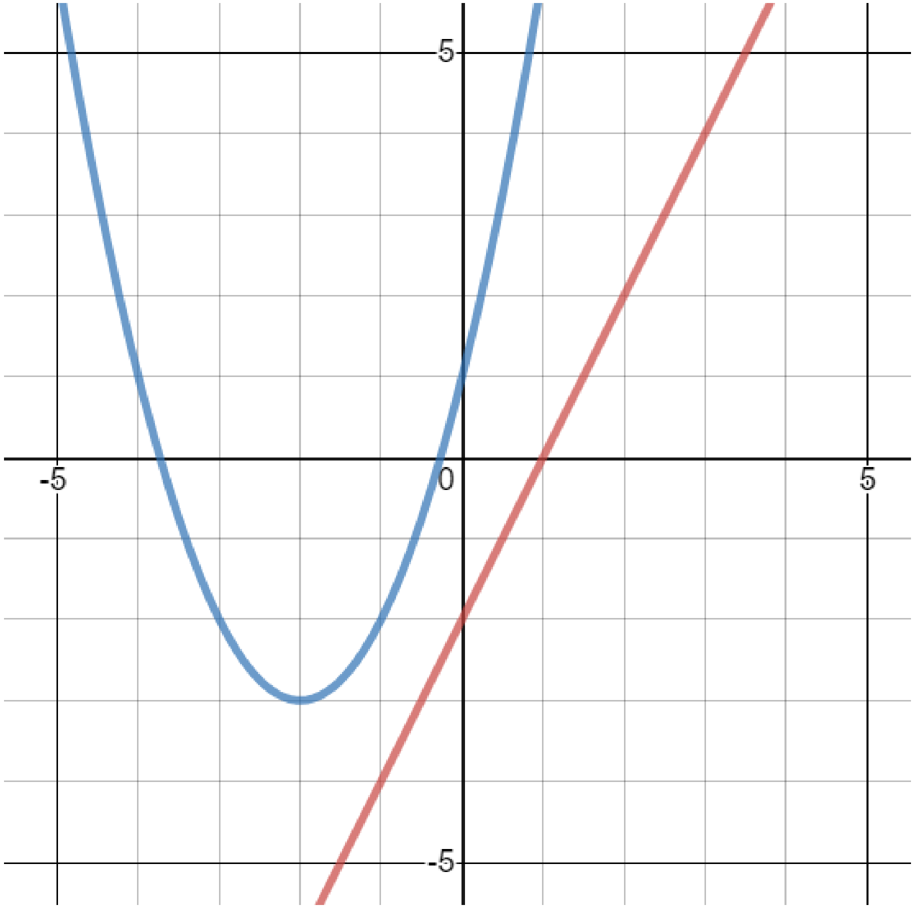
$$y = 2x - 3$$
$$y = x^2 + x - 5$$



$$x = 2, y = 1$$
$$x = -1, y = -5$$

Worked example	Your turn
By using the discriminant of a subsequent equation, show that the graphs of $4x + y = 3$ and $y = x^2 - 3x + 1$ have two points of intersection	By using the discriminant of a subsequent equation, show that the graphs of $2x + y = 3$ and $y = x^2 - 3x + 1$ have two points of intersection $x^2 - x - 2 = 0$ Discriminant $= 9 > 0$

Worked example	Your turn
Prove algebraically, and show graphically, that the lines never meet: $y = 3x - 3$ $y = x^2 + 5x + 4$	Prove algebraically, and show graphically, that the lines never meet: $y = 2x - 2$ $y = x^2 + 4x + 1$ $x^2 + 2x + 3 = 0$ Discriminant $= -8 < 0$



Worked example	Your turn
The line with equation $y = 3x + 4$ meets the curve with equation $kx^2 + 2y + (k - 8) = 0$ 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.	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. a) $k = 2$ b) $(-1, -1)$