

# chapter 2 Algebra 2

## Section 2.3 Solving quadratic and linear equations

### PROJECT MATHS Text & Tests 6

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#### Example 1

Find the point(s) of intersection between

- (i)  $x - y = -1$  LINEAR and the curve  $y = x^2 + 5x + 1$ . QUADRATIC

(i) ① Write linear as  
 $x = \dots$  or  $y = \dots$

$$\begin{aligned} x - y &= -1 \\ -y &= -1 - x \\ y &= 1 + x \end{aligned}$$

② Sub linear into  
quadratic & solve

$$\begin{aligned} 1 + x &= x^2 + 5x + 1 \\ x^2 + 4x &= 0 \\ x(x + 4) &= 0 \\ x = 0 &, x = -4 \end{aligned}$$

③ Sub answers  
into linear to  
get pts.

$$\begin{aligned} x = 0 &\Rightarrow y = 1 + 0 = 1, \text{ pt } (0, 1) \\ x = -4 &\Rightarrow y = 1 - 4 = -3, \text{ pt } (-4, -3) \end{aligned}$$

Solve the following pairs of simultaneous equations, one linear and one quadratic.

3.  $4x^2 - y = 0$  **QUADRATIC**  
 $2x + y = 2$  **LINEAR**

① rewrite linear	$2x + y = 2$ $y = 2 - 2x^*$
② Sub into quadratic and solve	$4x^2 - (2 - 2x) = 0$ $4x^2 + 2x - 2 = 0$ $2x^2 + x - 1 = 0$ $(2x - 1)(x + 1) = 0$ $\begin{array}{l l} 2x - 1 = 0 & x + 1 = 0 \\ 2x = 1 & \\ x = 1/2 & x = -1 \end{array}$
③ Sub back into linear to get points	$y = 2 - 2x^*$ $x = \frac{1}{2} \quad y = 2 - 2\left(\frac{1}{2}\right) = 2 - 1 = 1 \Rightarrow \text{pt. } \left(\frac{1}{2}, 1\right)$ $x = -1 \quad y = 2 - 2(-1) = 2 + 2 = 4 \Rightarrow \text{pt. } (-1, 4)$