



## SIMULTANEOUS EQUATIONS

write 'easy' one  $x = \dots$  or  $y = \dots$

sub into 'hard' one

**SOLVE \***

use easy one to get the 2<sup>nd</sup> coordinate

**\* OR ...**

use info (eg no intersection points or line is a tangent) to form a new Equation using the discriminant



ALGEBRAIC  
TECHNIQUES

## SIMULTANEOUS EQUATIONS

1 2 3 4 5

find the points of intersection of the line  $x - y - 1 = 0$  and the circle  $x^2 + y^2 = 25$

$$x - y - 1 = 0 \Rightarrow x = y + 1$$

$$(y + 1)^2 + y^2 = 25$$

$$y^2 + 2y + 1 + y^2 = 25$$

$$2y^2 + 2y - 24 = 0$$

$$2y^2 + 8y - 6y - 24 = 0$$

$$2y(y + 4) - 6(y + 4) = 0$$

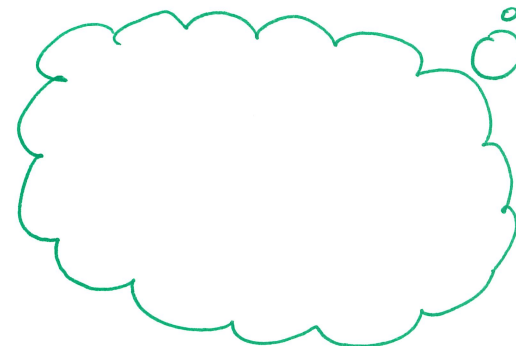
$$(2y - 6)(y + 4) = 0$$

$$2y - 6 = 0 \text{ OR } y + 4 = 0$$

$$y = 3 \text{ OR } y = -4$$

$$2 \times 24 = 48$$

$$\begin{array}{l|l} 1 \times 48 & 4 \times 12 \\ 2 \times 24 & 6 \times 8 \\ 3 \times 16 & \end{array}$$



$$y = 3$$

$$x = 3 + 1 = 4$$

$$(4, 3)$$

OR

$$y = -4$$

$$x = -4 + 1 = -3$$

$$(-3, -4)$$

