

You need to **memorise** the statements in the box below.

The discriminant ( $b^2 - 4ac$ ) can be used to determine the type of roots of the quadratic equation  $ax^2 + bx + c = 0$

$$b^2 - 4ac > 0 \Rightarrow 2 \text{ real distinct roots}$$

$$b^2 - 4ac = 0 \Rightarrow 1 \text{ real repeated root}$$

$$b^2 - 4ac < 0 \Rightarrow \text{no real roots}$$

2 real and equal roots for  $b^2 - 4ac = 0$  is accepted.

Determine the nature of the roots of  $x^2 + 4x + 2 = 0$ .

$$\begin{aligned}b^2 - 4ac &= 4^2 - 4 \times 1 \times 2 \\ &= 8\end{aligned}$$

$$b^2 - 4ac > 0 \Rightarrow 2 \text{ real distinct roots}$$