THE QUADRATIC FORMULA

Use the quadratic formula to solve the following quadratic equations, giving your answers in surd form.

1 $x^2+6x+5=0$ **2** $x^2+2x-8=0$ **3** $x^2-6x-7=0$

① $\Delta = b^2-4ac = 36-4\times1\times5 = 16 = 4^2$ >0 so 2 solutions.

so $x = \dfrac{-6\pm4}{2}$ $\therefore$ $x=-5$ or $x=-1$

② $\Delta = 2^2-4\times(-8)\times1 = 36 = 6^2$ >0 so 2 solutions.

So $x = \dfrac{-2\pm6}{2}$

$x=-4$ or $x=2$

③ $\Delta = (-6)^2-4\times(-7) = 64 = 8^2$ >0 so 2 solutions.

So $x = \dfrac{6\pm8}{2}$

$x=-1$ or $x=\dfrac{14}{2}=7$

THE QUADRATIC FORMULA

17 $3x^2+2x-2=0$ **18** $2x^2+3x-5=0$ **19** $x^2+6x+1=0$

(17) $\Delta = 2^2-4\times(-2)\times 3 = 28 = (2\sqrt{7})^2$ 2 solutions.

$$x=\frac{-2\pm 2\sqrt{7}}{2\times 3}=\frac{-1\pm\sqrt{7}}{3}$$

So either $x=\frac{-1-\sqrt{7}}{3}$ or $x=\frac{-1+\sqrt{7}}{3}$

(18) $\Delta = 3^2-4\times(-5)\times 2 = 49 = 7^2$ so 2 solutions.

So $x=\frac{-3\pm 7}{2\times 2}$

$\therefore$ $x=-\frac{5}{2}$ or $x=\frac{4}{4}=1$

(19) $\Delta = 6^2-4\times 1\times 1 = 32 = 2^5$ so 2 solutions.

$$x=\frac{-6\pm\sqrt{2^5}}{2\times 1}=\frac{-6\pm 4\sqrt{2}}{2}=-3\pm 2\sqrt{2}$$

$\therefore$ $x=-3-2\sqrt{2}$ or $x=-3+2\sqrt{2}$