

29-11-12

FACTOR THEOREM

① Write root
Sub in root

② DIVIDE

③ FACTORISE
quadratic

If $(x + 1)$ is a factor of $x^3 + 5x^2 + kx - 12$, find the value of k and the other two factors of the cubic expression.

$$\textcircled{1} f(-1) = (-1)^3 + 5(-1)^2 + k(-1) - 12 = 0$$

$$-1 + 5 - k - 12 = 0$$

$$-k - 8 = 0$$

$$k = -8$$

②

$$\begin{array}{r} x^2 + 4x - 12 \\ x+1 \overline{) x^3 + 5x^2 - 8x - 12} \\ \underline{+ x^3 + x^2} \\ 4x^2 - 8x \\ \underline{+ 4x^2 + 4x} \\ -12x - 12 \\ \underline{+ 12x + 12} \\ 0 \end{array}$$

③

$$x^2 + 4x - 12$$

$$(x + 6)(x - 2)$$

Solve Cubic

① GUESS

② DIVIDE
BY FACTOR③ SOLVE
QUADRATICSolve $x^3 - 7x - 6$.

$$\textcircled{1} f(-1) = (-1)^3 - 7(-1) - 6 = 0$$

$$\Rightarrow (x + 1) \text{ is a factor}$$

$$\textcircled{2} \begin{array}{r} x^2 - x + 6 \\ x+1 \overline{) x^3 + 0x^2 - 7x - 6} \\ \underline{+ x^3 + x^2} \\ 1x^2 - 7x \\ \underline{- 1x^2 + x} \\ 6x - 6 \\ \underline{- 6x + 6} \\ 0 \end{array}$$

③

$$\text{Solve } x^2 - x + 6 = 0$$

$$(x + 2)(x - 3) = 0$$

$$x = -2, 3$$

SOLUTIONS: $-2, -1, 3$