

Using the Factor Theorem

- (a) Show that $(x - 2)$ is a factor of $x^3 + x^2 - 4x - 4$.
- (b) Show that $(x - 3)$ is a factor of $2x^3 + x^2 - 18x - 9$.
- (c) Show that $(x - 1)$ is a factor of $4x^3 - 3x^2 - 1$.
- (d) Show that $(x + 1)$ is a factor of $x^3 - 10x^2 + 19x + 30$.

Factorise fully:

- (a) $x^3 + x^2 - 4x - 4$
- (b) $x^3 - 10x^2 + 19x + 30$
- (c) $x^3 - 4x^2 - 11x + 30$

Solve:

- (a) $2x^3 + x^2 - 18x - 9 = 0$
- (b) $x^3 - 7x^2 + 2x + 40 = 0$
- (c) $x^3 - 5x^2 + 5x + 3 = 0$

$(x + 2)$ and $(x - 3)$ are both factors of the cubic $x^3 + ax^2 + bx + 18$. Find the values of a and b .

$(x + 2)$ and $(x - 4)$ are both factors of the cubic $x^3 + 3x^2 + ax + b$. Find the third factor of this cubic.

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