

Harder Factor Theorem

(a) Show that $2x - 1$ is a factor of $2x^3 + 5x^2 - 7x + 2$

(b) Show that $3x + 1$ is a factor of $6x^3 + 21x^2 - 38x - 15$

(c) Show that $5x - 2$ is a factor of $5x^3 + 23x^2 + 40x - 20$

(a) Show that $2x + 1$ is a factor of $4x^3 + 4x^2 - 5x - 3$. Hence, fully factorise $4x^3 + 4x^2 - 5x - 3$.

(b) Show that $4x - 1$ is a factor of $4x^3 + 3x^2 - 25x + 6$. Hence, solve $4x^3 + 3x^2 - 25x + 6 = 0$.

(c) Show that $2x - 3$ is a factor of $6x^3 + 25x^2 - 31x - 30$. Hence, solve $6x^3 + 25x^2 - 31x - 30 = 0$.

(a) Given that $2x - 1$ is a factor of $4x^3 - 12x^2 + ax + 12$, find the value of a .

(b) Given that $3x + 2$ is a factor of $6x^3 + bx^2 + 27x + 14$, find the value of b .

(c) Given that $2x - 5$ is a factor of $cx^3 - 29x^2 + 16x - 15$, find the value of c .

(a) Given that both $x - 2$ and $2x + 1$ are factors of $6x^3 - ax^2 - 18x - b$, find the values of a and b .

(b) Given that $x - a$ is a factor of $3x^3 + 2x^2 - 12ax - 8a$, and that a is a non-zero integer, find the value of a .

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