

Factor Theorem 1

1. Show that $(x - 3)$ is a factor of $x^3 - 2x^2 - 5x + 6$ and find the other two factors.
2. Show that $(x + 3)$ is a factor of $2x^3 + 7x^2 + 2x - 3$ and find the other two factors.
3. Solve each of the following equations.
 - (a) $x^3 - 4x^2 - x + 4 = 0$
 - (b) $x^3 + 2x^2 - 11x - 12 = 0$
 - (c) $3x^3 - 4x^2 - 3x + 4 = 0$
 - (d) $x^3 - 7x - 6 = 0$
4. If $(x + 2)$ is a factor of $x^3 + ax^2 - x - 2$, find a and hence find the other two factors.
5. If $(x + 1)$ and $(x + 3)$ are both factors of $2x^3 + ax^2 + bx - 3$, find the values of a and b. Find the third factor and hence solve the equation $2x^3 + ax^2 + bx - 3 = 0$
6. 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.
7. If $(x - 3)$ and $(x + 2)$ are both factors of $2x^3 + ax^2 - 17x + b$, find the value of a and the value of b. Hence find the third factor.
8. Let $f(x) = px^3 + 3x^2 - 9x + q$ where p and q are constants. Given that $(x + 1)$ and $(x - 2)$ are factors of $f(x)$, find the value of p and the value of q.
9. Let $p(x) = 2x^3 - ax^2 - bx + 42$ where a and b are constants. Given that $(x - 2)$ and $(x + 3)$ are factors $p(x)$, find the value of a and the value of b.
10. Let $f(x) = 2x^3 + ax^2 + bx - 6$ where a and b are constants. Given that $f(-2) = 0$ and $f(\frac{1}{2}) = 0$, find the value of a and the value of b.