

Factor Theorem

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Factor Theorem

$x - p$ is a factor of $f(x)$ if and only if $f(p) = 0$.

Factor Theorem Extended

A function,

$$f(x) = a_n x^n + a_{n-1} x^{n-1} + \cdots + a_1 x + a_0$$

has a factor,

$$qx - p$$

if

$$f\left(\frac{p}{q}\right) = 0$$

where,

q divides a_n and
 p divides a_0 .

Exercises

1. State all possible values $\frac{p}{q}$ that could make the given polynomial 0.
 - (a) $3x^3 - 4x^2 + 7x + 8$
 - (b) $2x^3 - 8x^2 + 5x - 6$
 - (c) $4x^3 + 3x^2 - 11x + 2$
 - (d) $6x^3 - 7x^2 + 4x + 3$
 - (e) $8x^3 - 7x^2 + 23x - 4$
2. Find the equation whose roots are each 6 more than the roots of $x^2 + 8x - 1 = 0$.