Factor Theorem 3

RaiseMyMarks.com

2020

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. Factor fully.
   a) $18x^3 - 15x^2 - x + 2$
   b) $4x^4 - 19x^3 + 16x^2 - 19x + 12$
   c) $px^3 = (p - q)x^2 + (-2p - q)x + 2q$
   d) $5x^4 + x^3 - 22x^2 - 4x + 8$
   e) $abx^3 + (a - 2ab - b)x^2 + (2b - a - 2)x + 2$
   f) $6x^3 + x^2 - 46x + 15$
2. If -7 is a root of $x^2 + x - 2k = 0$, determine the other roots and find the value of k.