7.6 Rational Zero Theorem

Objective: ID the possible rational zeros of a polynomial function Find all rational zeros of a polynomial function

Rational Zero Theorem: gives a finite list of all possible rational zeros to help narrow down choices.

I. ID all Possible Zeros Using

Ex1)
$$f(x) = 2x^3 - 11x^2 + 12x + 9$$

Q

Q: The leading coefficient

P: The constant

$$\frac{P}{Q} = \frac{\text{all factors of P}}{\text{all factors of Q}} : \frac{\pm 1, \pm 3, \pm 9}{\pm 1, \pm 2}$$

Possible Rational Zeros ±1, ±1/2, ±3, ±3/2, ±9, ±9/2

12 potential zeros

II. Find all Zeros.

Ex3)
$$f(x) = 2x^4 - 13x^3 + 23x^2 - 52x + 60$$

From Calc: $x = 5$, 1.5
 $x = 20$

Ex4) $f(x) = x^4 + x^3 - 19x^2 + 11x + 30$

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 $x = 20$
 x

