6-6 / 6-7 Finding Zeros of Polynomial Functions

Nov. 30

Rational Zeros Theorem : *If a polynomial function f(x) has integer coefficients, then every rational zero of f(x) has the form* $\frac{p}{q}$ *where* $\frac{p}{q} = \frac{\pm(\text{factors of constant term})}{\pm(\text{factors of leading coefficient})}$

ex. 1 **Find the possible rational zeros of**

$f(x) = \overset{q}{3}x^3 + 2x^2 - x + \overset{p}{15}$

$$\frac{p}{q} = \frac{\pm(1,3,5,15)}{\pm(1,3)}$$

$$\frac{p}{q} = \pm\left(1, 3, 5, 15, \frac{1}{3}, \frac{5}{3}\right)$$

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ex. 2 **Find all zeros of** $f(x) = \overset{q}{3}x^4 + 11x^3 + 11x^2 + x - \overset{p}{2}$

$$\frac{p}{q} = \frac{\pm(1,2)}{\pm(1,3)} = \pm\left(1, 2, \frac{1}{3}, \frac{2}{3}\right)$$

zeros = $-1, -2, 1/3$

SCRATCH

	3	11	11	1	-2
-1	3	8	3	-2	0
2	3	17	45		
-2	3	5	1	-1	0

HW paper

-1	3	11	11	1	-2
	3	8	3	-2	0

$3x^3 + 8x^2 + 3x - 2$

-2	3	8	3	-2
	3	2	-1	0

$3x^2 + 2x - 1 = 0$

$(3x - 1)(x + 1) = 0$

$1/3, -1$