WORKSHEET

LESSON 3-8: RATIONAL ZERO THEOREM

KeyConcept Rational Zero Theorem	
Words	If $P(x)$ is a polynomial function with integral coefficients, then every rational zero of $P(x) = 0$ is of the form $\frac{p}{q}$, a rational number in simplest form, where p is a factor of the constant term and q is a factor of the leading coefficient.
Example	Let $f(x) = 6x^4 + 22x^3 + 11x^2 - 80x - 40$. If $\frac{4}{3}$ is a zero of $f(x)$, then 4 is a factor of −40, and 3 is a factor of 6.
Corollary to the Rational Zero Theorem	
If $P(x)$ is a polynomial function with integral coefficients, a leading coefficient of 1, and a nonzero constant term, then any rational zeros of $P(x)$ must be factors of the constant term.	

Possible Rational Roots= $\frac{\text{factors of the constant}}{\text{factors of the lead coefficient}}$ ← $\frac{p}{q}$

1) **List all of the possible rational zeros of** $g(x) = 3x^3 - 4x + 10$

p = factors/divisors of

$= \pm \quad , \pm \quad , \pm \quad , \pm$

q = factors/divisors of

$= \pm \quad , \pm$

Possible rational roots/zeros = $\frac{p}{q}$

$= \pm \quad , \pm - , \pm \quad , \pm - , \quad , \pm - , \quad , \pm -$

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