

$$936,800 = -153.6x^3 + 5760x^2 - 100,000$$

$-936,800$ $-936,800$

$$-153.6x^3 + 5760x^2 - 1,036,800 = 0$$

2.4 Rational Zeros

x - intercepts

$$y = 0$$

$$-2x^4 + 13x^3 - 21x^2 + 2x + 8$$

factors of
constant
P

$$\pm 1, \pm 2, \pm 4, \pm 8$$

factors of
leading coefficient
q

$$\pm 1, \pm 2$$

Possible Rational Zeros

$$\frac{p}{q} \quad \pm 1, \pm 2, \pm 4, \pm 8, \pm \frac{1}{2}$$

Graph

Real

$$f(x) = x^4 - 19x^2 + 48$$

$$p = \pm 1, \pm 2, \pm 3, \pm 4, \pm 6, \pm 12, \pm 24, \pm 48$$

$$q = \pm 1$$

$$\frac{p}{q} = \pm 1, \pm 2, \pm 3, \pm 4, \pm 6, \pm 8, \pm 12, \pm 16, \pm 24, \pm 48$$

$$-4, 4$$

$$\begin{cases} x-4=0 \\ x=4 \end{cases}$$

$$\begin{array}{r|rrrrr} 4 & 1 & 0 & -19 & 0 & 48 \\ & & 4 & 16 & -12 & -48 \\ \hline -4 & 1 & 4 & -3 & -12 & 0 \\ & & -4 & 0 & 12 & \\ \hline \end{array}$$

$$\begin{cases} x+4=0 \\ x=-4 \end{cases}$$

$$\begin{array}{cccc} 1 & 0 & -3 & 0 \\ x^2 & x & c & r \end{array}$$

$$x^2 - 3 = 0$$

$$\sqrt{x^2} = \sqrt{3}$$

$$x = \pm \sqrt{3}$$

DeCartes Rule of Signs

Real

positive

of changes in
sign in $f(x)$

$$f(x) = +x^4 - 19x^2 + 48$$

reduce
by 2

2 or 0

positive real roots

of sign changes

$f(-x)$

$$f(x) = x^4 - 19x^2 + 48$$

$$f(-x) = (-x)^4 - 19(-x)^2 + 48$$

$$x^4 - 19x^2 + 48$$

2 or 0

Sum of Roots

$$-\frac{B}{A}$$

$$Ax^2 + Bx + C = 0$$

