

MTH112 TUESDAY 11-20-12 CLASS NOTES

(36) $f(x) = 5x^3 - 29x^2 + 19x + 5$

$f(x) = + \quad - \quad + \quad +$ two changes: 2, 0 $\oplus$ real

$f(-x) = - \quad - \quad - \quad +$ ONE change: 1 $\ominus$ real

RZT $\Rightarrow \frac{P}{Q} \Rightarrow \frac{\pm 1, \pm 5}{\pm 1, \pm 5}$

$\Rightarrow \pm 1, \pm \frac{1}{5}, \pm 5$

$-\frac{1}{5} \mid \begin{array}{rrrr} 5 & -29 & +19 & 5 \\ & -1 & +6 & -5 \\ \hline 5 & -30 & 25 & 0 \end{array}$

$(x + \frac{1}{5}) = 0$
 $(5x + 1) = 0$

$\downarrow \quad \downarrow \quad \downarrow$
 $5x^2 - 30x + 25$

$5(x^2 - 6x + 5)$

$5(5x+1)(x^2-6x+5) = 0$

sum = -6

prod = 5

$\swarrow \quad \searrow$
 $-1 \quad -5$

$5(5x+1)(x-1)(x-5) = 0$

$x = \left\{ -\frac{1}{5}, 1, 5 \right\}$

? $\checkmark$?

$$(37) \quad f(x) = 3x^3 - 13x^2 + 13x - 3$$

$$f(+x) = + \quad - \quad + \quad - \quad \begin{array}{l} 3 \text{ changes} \\ \therefore 3 \text{ or } 1 + \mathbb{R} \end{array}$$

$$f(-x) = - \quad - \quad - \quad - \quad \therefore 0 \ominus \mathbb{R}$$

$$R \nsubseteq T \Rightarrow \left. \begin{array}{l} p \Rightarrow \pm 1, \pm 3 \\ q \Rightarrow \pm 1, \pm 3 \end{array} \right\} \pm 1, \pm \frac{1}{3}, \pm 3.$$

$$\begin{array}{r|rrrr} 1 & 3 & -13 & 13 & -3 \\ & & 3 & -10 & 3 \\ \hline & 3 & -10 & 3 & 0 \end{array}$$

$$\begin{array}{r|rrrr} 3 & 3 & -13 & 13 & -3 \\ & & 9 & -12 & 3 \\ \hline & 3 & -4 & 1 & 0 \end{array}$$

$$(x-1)(x-3)\left(x-\frac{1}{3}\right) = 0$$

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

$$x = \left\{ 1, 3, \frac{1}{3} \right\}$$

? ? ?