

# Math 418

Oct. 15

## Quiz 5

1.

$$f(x) = \frac{11x^3 + 4x + 1}{5x^3 + 15}$$

H.A. =  $x = 1/5$  ←  $\frac{15}{1} \cdot \frac{11}{5}$

→  $\boxed{1/5}$

$$5x^3 + 15 \overline{) 11x^3 + 0x^2 - 4x + 1}$$

$$\underline{-11x^3 + 0x^2 + 30x + 31}$$

$$-4x + 30 \quad 31$$

$$\begin{array}{c} 1 \quad 1 \quad 5 \overline{) 155} \\ 1 \quad 1 \quad 5 \overline{) 155} \\ 0 \quad 0 \quad 0 \end{array}$$

2.

$$r(x) = \frac{-6(x+4)(x-9)^3(x+7)(x-12)^5}{(x-8)^3(x-9)^3(x-12)^3}$$

hole;  $x \neq 9$   
 VA;  $x = 8$   
 root;  $x = -4, -7, 12$

$$\begin{array}{r} 3 \\ 5 \overline{) 15} \\ \underline{-10} \\ 5 \end{array}$$

3.

$$r(x) = \frac{2+x}{16+x} \cdot (0.65)^{16+x}$$

$$\frac{65}{100} /$$

$$^{20} (2+x) = \left( \frac{208+13x}{20} \right)^{20} \cdot \frac{13}{20} \cdot \frac{16+x}{1}$$

$$\begin{array}{c} 1 \quad 3 \\ 2 \quad 0 \quad 6 \quad 1 \quad 8 \overline{) 162} \\ \underline{2 \quad 0 \quad 8} \end{array}$$

$$40 + 2x = 208 + 13x$$

$$\begin{array}{r} -40 \quad -40 \\ 2x = 162 + 13x \end{array}$$

$$\begin{array}{r} 2x = 162 + 13x \\ \underline{-13x} \quad \underline{-13x} \end{array}$$

$$\begin{array}{r} -11x = 162 \\ \underline{-11} \quad \underline{-11} \end{array}$$

$$\begin{array}{r} 0 \quad 1 \quad 4 \quad 7 \overline{) 162} \\ 11 \overline{) 162} \\ \underline{11} \quad \downarrow \\ 52 \\ \underline{44} \\ 80 \end{array}$$

$$\frac{2+(15)}{16(15)} = \frac{17}{31}$$

$$\frac{2+25}{16+25} = \frac{27}{41}$$

$x \approx 25$  matches