

15 Quiz 15 MAT 1275 Professor Chiu

Name: _____

- This quiz consists of 1 question for a total of 10 points.
- You have 15 minutes to complete the quiz.
- Show all work and justify your answers.
- Scientific calculators are allowed.
- Wishing you success.

$$\begin{array}{c} X+4 \\ X \begin{array}{|c|c|} \hline X^2 & +4X \\ \hline -4 & -16 \\ \hline \end{array} \end{array}$$

1. Solve for x :

① Simplify the RHS:

$$\frac{x}{x+4} = \frac{32}{(x+4)(x-4)} + 5$$

$$\frac{x}{x+4} = \frac{32}{(x+4)(x-4)} + \frac{5(x+4)(x-4)}{(x+4)(x-4)}$$

$$\Rightarrow \frac{x}{x+4} = \frac{32 + 5(x^2 - 16)}{(x+4)(x-4)}$$

$$\Rightarrow \frac{x}{x+4} = \frac{32 + 5x^2 - 80}{(x+4)(x-4)} \Rightarrow \frac{x}{x+4} = \frac{5x^2 - 48}{(x+4)(x-4)}$$

② Multiply the least common multiple of $(x+4)$ and $(x+4)(x-4)$ on both

sides: $\downarrow (x+4)(x-4)$

$$\frac{x \cancel{(x+4)} \cancel{(x-4)}}{\cancel{(x+4)}} = \frac{(5x^2 - 48) \cancel{(x+4)} \cancel{(x-4)}}{\cancel{(x+4)} \cancel{(x-4)}}$$

$$\Rightarrow x \cdot (x-4) = 5x^2 - 48$$

$$\Rightarrow \begin{array}{c} x^2 - 4x = 5x^2 - 48 \\ \color{red}{-x^2 + 4x} \quad \color{red}{-x^2} \quad \color{red}{+4x} \end{array}$$

③ Solve for x :

$$\Rightarrow 0 = 4x^2 + 4x - 48 \Rightarrow 0 = 4(x^2 + x - 12) \quad \checkmark \text{ GCF}$$

$$\Rightarrow x^2 + x - 12 = 0 \Rightarrow (x-3)(x+4) = 0$$

$$\begin{array}{c} \cancel{x} - 3 \\ \cancel{x} + 4 \end{array} \Rightarrow \begin{array}{c} x-3=0, \quad x+4=0 \\ \color{red}{+3} \quad \color{red}{+3} \quad \color{red}{-4} \quad \color{red}{-4} \end{array}$$

$$x=3 \quad \text{or} \quad \cancel{x=-4} \quad (x=-4 \text{ will make } \frac{x}{x+4} \text{ undefined)}$$