

# 13 Classwork 13 MAT 1275 Professor Chiu

Name: \_\_\_\_\_

1. Solve

① Find the Least Common Multiple of  $(x+2)$  and  $(x+3)$

$\Rightarrow (x+2) \cdot (x+3)$

② Multiply  $(x+2)(x+3)$  on both sides:

$$\frac{x \cancel{(x+2)} (x+3)}{\cancel{x+2}} = \frac{(x-1) \cancel{(x+2)} \cancel{(x+3)}}{\cancel{x+3}}$$

$\Rightarrow x \cdot (x+3) = (x-1)(x+2)$

2. Solve

$$\frac{2}{x^2 - 4x + 3} = \frac{2x}{x-1} + \frac{1}{x-3}$$

① Find the Least Common Multiple of  $(x^2-4x+3)$ ,  $(x-1)$ , and  $(x-3)$

Since the LCM of  $(x-1)$  and  $(x-3)$  is  $(x-1) \cdot (x-3) = x^2 - 4x + 3$ , then the LCM of  $(x-1)$ ,  $(x-3)$ , and  $(x^2-4x+3)$  is  $x^2 - 4x + 3$

② Multiply  $x^2-4x+3$  (or  $(x-1)(x-3)$ ) on both sides:

$$\frac{2 \cancel{(x^2-4x+3)}}{\cancel{x^2-4x+3}} = \frac{2x \cancel{(x-1)} \cancel{(x-3)}}{\cancel{x-1} \cancel{x-3}} + \frac{1 \cancel{(x-1)} \cancel{(x-3)}}{\cancel{x-3}}$$

$\Rightarrow 2 = 2x(x-3) + 1 \cdot (x-1)$

$\Rightarrow 2 = 2x^2 - 6x + x - 1$

(but  $x \neq -2, x \neq -3$  since they make  $\frac{x}{x+2}$  or  $\frac{x-1}{x+3}$  undefined)

$$x \begin{array}{|c|c|} \hline x+3 & \\ \hline x^2 & +3x \\ \hline \end{array} \quad x \begin{array}{|c|c|} \hline x-1 & \\ \hline x^2 & -x \\ \hline +2 & +2x \\ \hline & -2 \\ \hline \end{array}$$

$\Rightarrow x^2 + 3x = x^2 - x + 2x - 2$

$\Rightarrow x^2 + 3x = x^2 + x - 2$

$\Rightarrow 3x = x - 2$

$\Rightarrow 2x = -2$

$\Rightarrow x = -1$

(but  $x \neq 1$  and  $x \neq 3$  because they make  $\frac{2x}{x-1}$  and  $\frac{1}{x-3}$  undefined)

$\Rightarrow 2 = 2x^2 - 5x - 1$

$\Rightarrow 0 = 2x^2 - 5x - 3$

$\Rightarrow 0 = (x-3)(2x+1)$

$\Rightarrow (x-3)=0$  or  $2x+1=0$

$\Rightarrow x=3$  or  $2x = \frac{-1}{2}$

$\Rightarrow x = \frac{-1}{2}$  or  $x = \frac{1}{2}$  (but  $x \neq 3$ )

$\Rightarrow x = \frac{1}{2}$  is the only solution

