

## Warm - Up

$$\text{Add. } \frac{-3 \overset{(x-3)}{\cancel{(x+3)}}}{(x+3)\overset{(x+3)}{\cancel{(x-3)}}} + \frac{4 \overset{(x+3)}{\cancel{(x+3)}}}{\overset{(x+3)}{\cancel{(x+3)}}(x-3)} = \frac{-3(x-3) + 4(x+3)}{(x+3)(x-3)}$$

$$\frac{-3x + 9 + 4x + 12}{(x+3)(x-3)} =$$

$$\boxed{\frac{x + 21}{(x+3)(x-3)}}$$

$$3x + 2z = 2$$

$$1y - 3z = 4 \rightarrow$$

$$2x + 1y = 5$$

$$3x + 0y + 2z = 2$$

$$0x + 1y - 3z = 4$$

$$2x + 1y + 0z = 5$$

# Chapter 7

## Learning Target 3

I can use matrices to find partial fraction decomposition.

Find the partial fraction decomposition.

$$1.) \frac{8x-42}{x^2+3x-18} \rightarrow \frac{8x-42}{(x+6)(x-3)}$$

$$\begin{array}{r} -18 \\ 6 \quad -3 \\ \hline 3 \\ + \end{array}$$

$$8x-42 = A(x+6) + B(x-3)$$

$$8x-42 = Ax + 6A + Bx - 3B$$

$$8x-42 = Ax + Bx + 6A - 3B$$

$$\cancel{8x} = \cancel{Ax} + \cancel{Bx} \rightarrow A + B = 8$$

$$-42 = 6A - 3B \rightarrow 6A - 3B = -42$$

$$\frac{-2}{(x-3)} + \frac{10}{(x+6)}$$

$$\begin{bmatrix} 1 & 1 \\ 6 & -3 \end{bmatrix}^{-1} \begin{bmatrix} 8 \\ -42 \end{bmatrix}$$

$$A = -2$$

$$B = 10$$

Find the partial fraction decomposition.

$$2.) \frac{6}{x^2 + 3x + 2} \rightarrow \frac{6}{(x+2)(x+1)}$$

$$6 = A(x+2) + B(x+1)$$

$$6 = Ax + 2A + Bx + B$$

$$6 = Ax + Bx + 2A + B$$

$$0x = Ax + Bx$$

$$6 = 2A + B$$

$$\rightarrow A + B = 0$$

$$2A + B = 6$$

$$\boxed{A = 6 \quad B = -6}$$

$$\frac{6}{x+1} + \frac{-6}{x+2}$$

$$\begin{bmatrix} 1 & 1 \\ 2 & 1 \end{bmatrix}^{-1} \begin{bmatrix} 0 \\ 6 \end{bmatrix}$$

Find the partial fraction decomposition.

$$3.) \frac{x+7}{x^2 - x - 6}$$

Homework:

P. 554 69, 75, 76, 77