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9/19/16

69. $2 = A(x-5) + B(x-3)$

$$2 = Ax - 5A + Bx - 3B$$

$$0x = Ax + Bx \rightarrow \begin{bmatrix} 1 & 1 \\ -5 & -3 \end{bmatrix}^{-1} \begin{bmatrix} 0 \\ 2 \end{bmatrix} = \begin{bmatrix} -1 \\ 1 \end{bmatrix}$$

$$2 = -5A - 3B$$

$$\boxed{\frac{-1}{x-3} + \frac{1}{x-5}}$$

75. $\frac{-x+10}{x^2+x-12} \rightarrow \frac{-x+10}{(x+4)(x-3)}$

$$-x+10 = A(x+4) + B(x-3)$$

$$-x+10 = Ax + 4A + Bx - 3B$$

$$-x = Ax + Bx \rightarrow \begin{bmatrix} 1 & 1 \\ 4 & -3 \end{bmatrix}^{-1} \begin{bmatrix} -1 \\ 10 \end{bmatrix} = \begin{bmatrix} 1 \\ -2 \end{bmatrix}$$

$$10 = 4A - 3B$$

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

76. $\frac{7x-7}{x^2-3x-10} \rightarrow \frac{7x-7}{(x-5)(x+2)}$

$$7x-7 = A(x-5) + B(x+2)$$

$$7x-7 = Ax - 5A + Bx + 2B$$

$$7x = Ax + Bx \rightarrow \begin{bmatrix} 1 & 1 \\ -5 & 2 \end{bmatrix}^{-1} \begin{bmatrix} 7 \\ -7 \end{bmatrix} = \begin{bmatrix} 3 \\ 4 \end{bmatrix}$$

$$-7 = -5A + 2B$$

$$\boxed{\frac{3}{x+2} + \frac{4}{x-5}}$$

77.

$$\frac{x+17}{2x^2+5x-3} \rightarrow \frac{x+17}{(x+3)(2x-1)}$$

$$\frac{-6}{5} \cdot -1$$

$$x+17 = A(x+3) + B(2x-1)$$

$$x+17 = Ax + 3A + 2Bx - B$$

$$x = Ax + 2Bx \rightarrow 1 = 1A + 2B$$

$$17 = 3A - B \rightarrow 17 = 3A - B$$

$$\begin{array}{r} 1 = A + 2B \\ 2[17 = 3A - B] \end{array} \rightarrow \begin{array}{r} 1 = A + 2B \\ + 34 = 6A - 2B \\ \hline 35 = 7A \end{array}$$

$$1 = (5) + 2B \quad \leftarrow 5 = A$$

$$-4 = 2B$$

$$-2 = B \rightarrow$$

$$\boxed{\frac{5}{2x-1} + \frac{-2}{x+3}}$$