

Warm up

Add.

$$\textcircled{1} (2x^2 + 3x) + (6x - 8)$$

$$2x^2 + 9x - 8$$

$$\textcircled{2} (5x - 8) + (-6x + 1)$$

$$-x - 7$$

Subtract

$$\textcircled{3} (8x^2 - 5x) + (+6x^2 + 2x)$$

$$14x^2 - 3x$$

$$\textcircled{4} (2x - 1) + (-4x + -5)$$

$$-2x - 6$$

## Notes #4 Add Rational Expressions

## Like Denominators

$$\frac{2}{5} + \frac{1}{5} = \frac{3}{5}$$

$$\textcircled{1} \quad \frac{x-3}{x+4} + \frac{5x-2}{x+4} = \frac{6x-5}{x+4}$$

combine  
Keep denom. same

try these:

$$\textcircled{2} \quad \frac{x+12}{2x-5} + \frac{7x+1}{2x-5} = \frac{8x+13}{2x-5}$$

$$\textcircled{3} \quad \frac{x+1}{x^2-1} + \frac{6x-8}{x^2-1} = \frac{7x-7}{x^2-1}$$

$\frac{7(x-1)}{(x+1)(x+1)}$   
 $\frac{7}{x+1}$

## UnLike Denominators

2 Senarios

$$\begin{array}{l} \boxed{2} \cdot \frac{1}{3} + \frac{1}{6} \\ \boxed{2} \cdot \frac{1}{3} + \frac{1}{6} \end{array}$$

$$\frac{2}{6} + \frac{1}{6} = \frac{3}{6} \rightarrow \frac{1}{2}$$

$$\begin{array}{l} \boxed{7} \cdot \frac{1}{5} + \frac{1}{7} \cdot \boxed{5} \\ \boxed{7} \cdot \frac{1}{5} + \frac{1}{7} \cdot \boxed{5} \end{array}$$

$$\frac{7}{35} + \frac{5}{35} = \frac{12}{35}$$

OK - So now with Xs

$$\textcircled{1} \frac{4(3x)}{4(x-6)} + \frac{2x+1}{\boxed{4x-24}} \text{ factor}$$

trying to  
find common  
denominator

$$\frac{\boxed{12x}}{4(x-6)} + \frac{2x+1}{4(x-6)} = \frac{\boxed{14x+1}}{4(x-6)}$$

try this:

$$\frac{2}{5x-20} + \frac{7}{x-4}$$

$$\frac{2}{5(x-4)} + \frac{5(7)}{5(x-4)} = \frac{37}{5(x-4)}$$

another style

$$\textcircled{2} \quad \frac{2(x+7)}{x-5(x+7)} + \frac{3(x-5)}{x+7(x-5)}$$

$$\frac{2x+14}{(x-5)(x+7)} + \frac{3x-15}{(x-5)(x+7)}$$

$$\frac{5x-1}{(x-5)(x+7)}$$

no factoring.  
need  
 $(x-5)(x+7)$   
as the denom.  
do not cross  
anything out

$$\textcircled{2} \quad \frac{5(x-2)}{x+10(x-2)} + \frac{4x(x+10)}{x-2(x+10)}$$

$$\frac{5x-10}{(x+10)(x-2)} + \frac{4x^2+40x}{(x-2)(x+10)} = \frac{4x^2+45x-10}{(x-2)(x+10)}$$

Common  
denom:  
 $(x+10)(x-2)$

try this :

$$\frac{8(x-6)}{x+1(x-6)} + \frac{5(x+1)}{x-6(x+1)}$$

$$\frac{8x-48}{(x+1)(x-6)} + \frac{5x+5}{(x-6)(x+1)} = \frac{13x-43}{(x-6)(x+1)}$$