

This final unit will be really easy if we can just remember how to factor!

Remember this?

$$\underline{a}x^2 + 7x + 10 \leftarrow c$$

↑
b

Let's practice factoring again:

$x^2 - 8x + 12$ $(x-2)(x-6)$	$\begin{matrix} \boxed{ac} \\ 12 \\ \hline 3,4 \\ -2,6 \\ \hline 1,12 \end{matrix}$	$2x^3 - 12x^2 + 10x$ $2x(x^2 - 6x + 5)$ $2x(x-1)(x-5)$	$9x^2 - 25$ $a^2 - b^2$ $(a-b)(a+b)$ $(3x-5)(3x+5)$	$5x^2 + 16x + 3$ ac $5x^2 + 1x + 15x + 3$ $\frac{15}{3,5}$ $x(5x+1) + 3(5x+1)$ $\frac{1,15}$ $(5x+1)(x+3)$
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Now simplify all of these expressions. What do they all have in common?

$\frac{5}{5} = 1$	$\frac{2398175}{2398175} = 1$	$\frac{x}{x} = 1$	$\frac{x-5}{x-5} = 1$	$\frac{6y^2}{6y^2} = 1$
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same numerator/denominator! = 1 (cancel)

So let me show you an example of simplifying a rational expression:

$$\frac{x^2 + 5x - 14}{x^2 + 11x + 28} = \frac{(x-2)\cancel{(x+7)}}{(x+4)\cancel{(x+7)}} = \frac{(x-2)}{(x+4)} \checkmark$$

- ① FACTOR!!
- ② CANCEL

That's it! Let's practice a couple together:

$\frac{15x^2 + 10x}{5x^2 - 25x} = \frac{\cancel{5x}(3x+2)}{\cancel{5x}(x-5)}$ $= \boxed{\frac{3x+2}{x-5}}$	$\frac{x^2 + 6x - 40}{2x^4 + 24x^3 + 40x^2} = \frac{(x-4)(x+10)}{2x^2(x^2 + 12x + 20)}$ $= \frac{\cancel{(x-4)}\cancel{(x+10)}}{2x^2(x+2)\cancel{(x+10)}} = \boxed{\frac{x-4}{2x^2(x+2)}}$
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When you pass these off to me I will give you your worksheet to start in class!

$\frac{6x^2 + 24x}{21x^2 + 6x} = \frac{\cancel{26}x(x+4)}{\cancel{3}x(7x+2)}$ $= \boxed{\frac{2(x+4)}{7x+2}}$	$\frac{10x + 70}{2x^2 + 11x - 21} = \frac{10(x+7)}{2x^2 - 3x + 14x - 21}$ $\begin{matrix} \boxed{ac} \\ -42 \\ \hline -6,7 \\ \hline -3,14 \end{matrix}$ $= \frac{10\cancel{(x+7)}}{\cancel{(x+7)}(2x-3)} = \boxed{\frac{10}{2x-3}}$
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