C11 - 6.0 - Rationals Review

NPVs/Restrictions:
Set Denominator $\neq 0$ *and solve*

Simplify/Multiply/Divide

Factor!!!
Simplify
Multiply (Cross Cancel)
Divide: Flip and Multiply

Think what cancels and what are you left with

Watch out for

Common Mistakes
Negative Distribution!
$GCF = -1$
BEDMAS
Don't Reverse the process!

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

$x + 2 \neq 0 \qquad x + 3 \neq 0$
$x \neq -2 \qquad x \neq -3$

Check Answer

$2(x+3)$ Distribute
$\underline{2x + 6}$ ✓   Multiply

$x = 3^*$

$2(x+3)$ $2x + 6$
$2((3)+3)$ $2(3)+6$
12 ✓ 12 ✓

Pick an Arbitrary $x\ value$
Substitute into question and answer
Must be equal!

Add/Subtract

Factor
Get an LCD

Do to top, Do to bottom
Add/Subtract

Denominator usually doesn't cancel

Remember
Don't FOIL/Distribute LCD
We only FOIL/Distribute if you can combine like terms!

Sometimes factor the top to see if it simplifies first*
Possibly refactor the top/simplify again at end

$$\frac{1}{x} + \frac{3}{(x+2)} =$$
$$\frac{1(x+2) + 3(x)}{x(x+2)} =$$
$$\frac{4x+2}{x(x+2)} ✓$$

Equations

Check Answer!

Substitute into Equation with Brackets $LHS = RHS$ Grade 8!!!
Left Hand Side Must Equal Right Hand Side (Of Equal Sign)

Factor
LCD
Multiply Both Sides by LCD   **OR**   Get an LCD/Cross Multiply
Simplify
Solve
Answer the question!

Make sure you cross reference your answers with your NPV's!

$$v = \frac{d}{t}$$

$$\left(\frac{2}{x+2} + 3 = \frac{11}{x+2}\right) \times LCD = (x+2)$$
$$2 + 3(x+2) = 11$$
$$2 + 3x + 6 = 11$$
$$3x = 3$$
$$x = 1$$ ✓

$$\frac{2}{1+2} + 3 = \frac{11}{3} = \frac{11}{1+2}$$

Word Problems
Let Statements
Table/Diagram
Equation/s
Substitute
Solve/Sub/Solve

	Amount	Time	Rate
Hose A	1 pool	3 hours	$\frac{1\ pool}{3\ hours}$
Hose B	1 pool	x hours	$\frac{1\ pool}{x\ hours}$
Together	1 pool	2 hours	$\frac{1\ pool}{2\ hours}$

Complex Fractions   **OR**   Multiply top and bottom by LCD

Add Fractions top and bottom, flip and multiply

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

$$\frac{\left(3 + \frac{2}{x}\right) \times x}{\left(1 - \frac{2}{x}\right) \times x}$$
$$\frac{3x + 2}{x - 2} ✓$$

Common Mistakes

Can do ✓   Can't do

$$\frac{(a)(b)(c)}{(a)(b)} = c$$ ✓

$$\frac{(a) + (b)}{(a)(b)} \neq \frac{1+b}{b}$$ ✗

Just try it before and after on your calculator (or on paper or in your head) with square brackets around the top and the bottom and if it's the same its allowed.* Com'on People!!!