MATH 0270/1314 COLLEGE ALGEBRA Week 7 3/4/19 Monday

1.5 RATIONAL EXPRESSION involving polynomials.
(fractional)

- look for common factors in both numerator & denominator
- cancel out the factors that simplifies to one.

examples

(1) $\frac{15x^2}{10x} = \frac{3\cdot\cancel{5}\cdot\cancel{x}\cdot x}{2\cdot\cancel{5}\cdot\cancel{x}} = \frac{3x}{2}$.

(2) $\frac{18y^2}{60y^3} = \frac{\cancel{2}\cdot 3\cdot\cancel{3}\cdot\cancel{y}\cdot\cancel{y}}{\cancel{2}\cdot 2\cdot\cancel{3}\cdot 5\cdot\cancel{y}\cdot\cancel{y}\cdot y} = \frac{3}{10y}$

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(3) $\frac{2x^2y}{xy-y} = \frac{2\cdot x\cdot x\cdot\cancel{y}}{(x-1)\cdot\cancel{y}} = \frac{2x^2}{x-1}$

(4) $\frac{9x^2+9x}{2x+2} = \frac{9x\cancel{(x+1)}}{2\cancel{(x+1)}} = \frac{9x}{2}$.

there has to be something in common top and bottom.
if there is none, go back and check if you did every correctly.

(5) $\frac{x-5}{10-2x} = \frac{x-5}{2(5-x)} = \frac{-1}{2}$ or $\frac{1}{-2} = -\frac{1}{2}$.

☆ $(x-5)$ and $(5-x)$ are not the same, but they are opposites of each other, $(x-5)+(5-x)=0$.

$\frac{a-b}{b-a} = -1$ ALWAYS

※ A number divided by its opposite equals -1 ※

So I can cancel opposites if I leave behind a factor of $-$

(6) $\frac{12-4x}{x-3} = \frac{4\cancel{(3-x)}}{\cancel{x-3}} = -4$.

☆ if you're not certain if something are opposites, pick a number and substitude and check w/ calculator

①.

(7) $\frac{y^2-16}{y+4} = \frac{\cancel{(y+4)}(y-4)}{\cancel{(y+4)}} = y-4.$

(8) $\frac{x^2+8x-20}{x^2+11x+10} = \frac{\cancel{(x+10)}(x-2)}{\cancel{(x+10)}(x+1)} = \frac{x-2}{x+1}$

- $\cancel{x}$ you can only cancel factors, factor are things that multiply. You $\boxed{\text{cannot}}$ cancel terms, terms are things that are added/subtracted.

(9) $\frac{x^2+2x-15}{x^2-9} = \frac{(x+5)\cancel{(x-3)}}{(x+3)\cancel{(x-3)}} = \frac{x+5}{x+3}$

$\frac{\cancel{a}c}{\cancel{a}b} = \frac{c}{b}$

$\frac{a+c}{a+b}$ is in simplest form.

(10) $\frac{x^2+10x+24}{x^2-16} = \frac{\cancel{(x+4)}(x+6)}{\cancel{(x+4)}(x-4)} = \frac{x+6}{x-4}$

(11) $\frac{25-x^2}{x^2+12x+35} = \frac{(5+x)(5-x)}{(x+5)(x+7)} = \frac{\cancel{(x+5)}(5-x)}{\cancel{(x+5)}(x+7)} = \frac{5-x}{x+7}$

(12) $\frac{x^2+15x+50}{x^2+3x-70} = \frac{\cancel{(x+10)}(x+5)}{\cancel{(x+10)}(x-7)} = \frac{x+5}{x-7}.$