

# 6.2 Complex Fractions and Rationalizing

# NOTES

Write your questions here!

## Complex Fractions

Standard Way

$$\frac{\frac{u^2+u}{4}}{\frac{4u+24}{34}}$$

$$= \frac{u^2+u}{4} \cdot \frac{34}{4u+24}$$

$$= \frac{34u^3+34u^2}{16u+96}$$

ex 1:

$$\frac{\frac{u^2}{4} + \frac{u}{4}}{\frac{4u}{3} + \frac{8u}{4}}$$

Let's Get Brusty

$$\frac{\left(\frac{u^2}{4} + \frac{u}{4}\right) \cdot 4 \cdot 3 \cdot 4}{\left(\frac{4}{3} + \frac{8}{4}\right) \cdot 4 \cdot 3 \cdot 4} = \frac{34u^2+34u}{4 \cdot 4u + 8 \cdot 4}$$

$$= \frac{34u^2+34u}{16u+96}$$

Ex 2:

$$\frac{\frac{1}{5} - \frac{3}{4}}{\frac{16}{x^2} + \frac{5}{x}} \cdot \frac{5 \cdot 4 \cdot x^2}{5 \cdot 4 \cdot x^2}$$

$$= \frac{4 \cdot x^2 - 5 \cdot 3 \cdot x^2}{5 \cdot 4 \cdot 16 + 5 \cdot 5 \cdot 4 \cdot x}$$

$$= \frac{4x^2 - 15x^2}{320 + 100x}$$

$$= \frac{-11x^2}{320 + 100x}$$

Ex 3:

$$\frac{\frac{2}{m+4} - \frac{2m}{9}}{\frac{m}{9} - \frac{4}{m+4}} \cdot \frac{(m+4)9}{(m+4)9}$$

$$= \frac{2 \cdot 9 - 2m(m+4)}{m(m+4) - 4 \cdot 9}$$

$$= \frac{18 - 2m^2 - 8m}{m^2 + 4m - 36}$$

$$= \frac{-2m^2 - 8m + 18}{m^2 + 4m - 36}$$

Ex 4:

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

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

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

$$= -2x-1$$

Ex 5:

$$\frac{\frac{2}{x-5} + 3}{\frac{x}{4} - \frac{3}{x}} \cdot \frac{(x-5)4x}{(x-5)4x}$$

$$= \frac{2 \cdot 4 \cdot x + 3(x-5)4x}{x(x-5)x - 3(x-5)4}$$

$$= \frac{8x + 12x^2 - 60x}{x^3 - 5x^2 - 12x + 60}$$

$$= \frac{12x^2 - 52x}{x^3 - 5x^2 - 12x + 60}$$

## Complex Rationalizing

Ex 6:

$$\frac{x+3}{4+\sqrt{x}} \cdot \frac{4-\sqrt{x}}{4-\sqrt{x}}$$

$$= \frac{(x+3)(4-\sqrt{x})}{16 + 4\sqrt{x} - 4\sqrt{x} - x}$$

$$= \frac{(x+3)(4-\sqrt{x})}{16-x}$$

$$\begin{aligned} \text{Ex 7: } \frac{5-x}{\sqrt{x+2}-1} \cdot \frac{\sqrt{x+2}+1}{\sqrt{x+2}+1} &= \frac{(5-x)(\sqrt{x+2}+1)}{(\sqrt{x+2})^2-1^2} \\ &= \frac{(5-x)(\sqrt{x+2}+1)}{x+2-1} \\ &= \frac{(5-x)(\sqrt{x+2}+1)}{x+1} \end{aligned}$$

$$\begin{aligned} \text{Ex 8: } \frac{2x+1}{\sqrt{x}-\sqrt{x+1}} \cdot \frac{(\sqrt{x}+\sqrt{x+1})}{(\sqrt{x}+\sqrt{x+1})} &= \frac{(2x+1)(\sqrt{x}+\sqrt{x+1})}{(\sqrt{x})^2-(\sqrt{x+1})^2} \\ &= \frac{(2x+1)(\sqrt{x}+\sqrt{x+1})}{x-(x+1)} \end{aligned}$$

You try!

1)

2)

$$= -\frac{(2x+1)(\sqrt{x}+\sqrt{x+1})}{1}$$

## SUMMARY:

Now,  
summarize  
your notes  
here!

## REVIEW SKILLZ

Directions: Simplify. Use only positive exponents.

1)  $5x^{-4}(6x^{-3})$

$$\begin{aligned} &= -30x^{-7} \\ &= \frac{-30}{x^7} \end{aligned}$$

2)  $\frac{15y^7}{20y^{14}} = \frac{3}{4y^7}$

3)  $(4h^{-5})^3$

$$\begin{aligned} &= 64h^{-15} \\ &= \frac{64}{h^{15}} \end{aligned}$$

4)  $\left(\frac{3n^{13} \cdot 4m^{-8}n^{-5}}{(m^3n^{-3})^2}\right)^{-3}$

$$\begin{aligned} &= \left(\frac{12n^8m^{-8}}{m^6n^{-6}}\right)^{-3} \\ &= \left(\frac{12n^{14}}{m^{-2}}\right)^{-3} \\ &= \left(\frac{m^2}{12n^{14}}\right)^3 \\ &= \frac{m^6}{1728n^{42}} \end{aligned}$$