Math 1010 Sec 7.3 10/10/2012

#50

#80

#75

#50 $\dfrac{3\cdot 4t}{3\cdot 9a^8b^7} + \dfrac{5s}{27a^4b^3}\cdot\dfrac{a^4b^4}{a^4b^4}$ LCD: $27a^8b^7$

$$\frac{12t}{27a^8b^7} + \frac{5sa^4b^4}{27a^8b^7}$$

$$\boxed{\frac{12t + 5sa^4b^4}{27a^8b^7}}$$

#75 $\dfrac{4}{(x+1)} + \dfrac{1}{(x^2-x+1)} - \dfrac{12}{x^3+1}$

$$\frac{4\cdot(x^2-x+1)}{(x+1)\cdot(x^2-x+1)} + \frac{1\cdot(x+1)}{(x^2-x+1)(x+1)} - \frac{12}{(x+1)(x^2-1x+1)}$$

x^2-x+1 ac: 1 b: -1

$1,1$	2
$-1,-1$	-2

$$\frac{4(x^2-x+1)}{(x+1)(x^2-x+1)} + \frac{(x+1)}{(x+1)(x^2-x+1)} - \frac{12}{(x+1)(x^2-x+1)}$$ LCD: $(x+1)(x^2-x+1)$

$$\frac{4x^2-4x+4+x+1-12}{(x+1)(x^2-x+1)}$$

Ans $\dfrac{4x-7}{x^2-x+1}$

$$\frac{4x^2-3x-7}{(x+1)(x^2-x+1)} = \frac{(x+1)(4x-7)}{(x+1)(x^2-x+1)}$$

ac: -28 b: -3

$4,-7$	-3 ✓

$\frac{4}{4} = \frac{1}{1}$ $\quad \frac{-7}{4}$

#80 $\dfrac{8}{(3r-1)^2} + \dfrac{2\cdot(3r-1)}{(3r-1)_{(3r-1)}} - \dfrac{6(3r-1)^2}{1(3r-1)^2}$ LCD: $(3r-1)^2$

$$\frac{8}{(3r-1)^2} + \frac{2(3r-1)}{(3r-1)^2} - \frac{6(3r-1)^2}{(3r-1)^2}$$

$(3r-1)(3r-1)$
$9r^2-3r-3r+1$

$$\frac{8+6r-2-6(9r^2-6r+1)}{(3r-1)^2}$$

$$\frac{8+6r-2-54r^2+36r-6}{(3r-1)^2}$$

$$\frac{-54r^2+42r}{(3r-1)^2} \text{ or } = \frac{-6r(9r-7)}{(3r-1)^2}$$

Sec 7.3 Complex Fractions

Defn: A complex Fraction is a Quotient having a fraction in the numerator, a fraction in the denominator or both

Ex: $\dfrac{2+\frac{5}{x}}{3}$, $\dfrac{5}{\frac{2}{x-1}+3}$, $\dfrac{\frac{1}{x}+3}{x+\frac{2}{x}}$

Goal for simplifying a Complex Fraction: Rewrite as a Single Fraction

Method 1: Flip & multiply Method

Step 1: Simplify the Numerator and the denominator seperately (aka single fraction on top, single fraction on bottom)

Step 2: flip and multiply the denominator fraction

Step 3: Simplify the Result, if possible

$$\frac{\frac{y+1}{y}}{\frac{y-2}{3y}} = \frac{(y+1)\cdot 3y}{y\cdot(y-2)} = \frac{3(y+1)}{y-2}$$

$$\frac{\frac{2}{1}\cdot\frac{x}{x}+\frac{3}{x}}{\frac{5}{1}\cdot\frac{x}{x}-\frac{x-1}{x}} = \frac{\frac{2x+3}{x}}{\frac{5x+x-1}{x}} = \frac{\frac{2x+3}{x}}{\frac{6x-1}{x}}$$

$$= \frac{(2x+3)\cdot x}{x\cdot(6x-1)} = \boxed{\frac{2x+3}{6x-1}}$$

Method #2 : LCD Method

Step 1 : Find the LCD of Each Fraction in the Numerator and the Denominator

Step 2 : Multiply the Numerator and the Denominator by the LCD (aka clear the fractions using LCD)

Step 3 : Simplify the Resulting fraction if possible

Ex : $\dfrac{2+\frac{3}{x}}{5+\frac{x-1}{x}}$ Recall Earlier Ans : $\dfrac{2x+3}{6x-1}$

LCD : x

$$\frac{\left(2+\frac{3}{x}\right)\cdot x}{\left(5+\frac{x-1}{x}\right)\cdot x} = \frac{2x+\frac{3x}{x}}{5x+\frac{(x-1)x}{x}}$$

$$= \frac{2x+3}{5x+(x-1)}$$

$$= \frac{2x+3}{6x-1}$$

Ex: $\dfrac{\left(x + \frac{5}{x}\right) x(x-2)}{\left(4x - \frac{1}{x-2}\right) x(x-2)}$ LCD: $x(x-2)$

$$\frac{x^2(x-2) + 5(x-2)}{4x^2(x-2) - x} = \frac{(x-2)(x^2+5)}{4x^3 - 8x^2 - x}$$

$$= \boxed{\frac{(x-2)(x^2+5)}{x(4x^2 - 8x - 1)}}$$

ac	b
-4	-8
1, -4	-3
2, -2	0