Bellwork Thursday, May 9, 2019

1. Solve. Round to the nearest hundredth when necessary.

$$\frac{x}{x+6}+\frac{8}{x-5}=\frac{x+83}{x^2+x-30}$$

2. Simplify. $$\frac{\frac{7x}{2y^3}+\frac{3}{4x^2y}}{\frac{5}{12xy^5}-\frac{2}{x^3y^2}}$$

3. Find this difference. $$\frac{5x}{x^2-3x-18}-\frac{x+1}{x^2-36}$$

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ANSWERS

1. Solve. Round to the nearest hundredth when necessary.

$$\frac{x}{x+6}+\frac{8}{x-5}=\frac{x+83}{x^2+x-30}$$

x^2+x-30: -30, -5, $+6$, 1

$(x+6)(x-5)\left(\frac{x}{x+6}+\frac{8}{x-5}\right)=\frac{x+83}{(x+6)(x-5)}(x+6)(x-5)$

$x=-7$

$x(x-5)+8(x+6)=x+83$

$x^2-5x+8x+48=x+83$

$x^2+3x+48=x+83$

$-x\ -83 \quad -x\ -83$

$x^2+2x-35$: -35, $+7$, -5, $+2$

$(x+7)(x-5)=0$

$x=-7, 5$

5 extraneous solution

2. Simplify. $\dfrac{\frac{7x}{2y^3}+\frac{3}{4x^2y}}{\frac{5}{12xy^5}-\frac{2}{x^3y^2}}\cdot\dfrac{12x^3y^5}{12x^3y^5}$

GCF of all 4 denominators is $12x^3y^5$

$$\frac{7x(6x^3y^2)+3(3xy^4)}{5(x^2)-2(12y^3)}=\frac{42x^4y^2+9xy^4}{5x^2-24y^3}$$

3. Find this difference. $\dfrac{5x}{x^2-3x-18}-\dfrac{x+1}{x^2-36}$

$x^2-3x-18$: -18, -6, $+3$, -3

$=\dfrac{5x}{(x-6)(x+3)}-\dfrac{x+1}{(x+6)(x-6)}$

LCD $=(x+6)(x-6)(x+3)$

$=\dfrac{(x+6)}{(x+6)}\cdot\dfrac{5x}{(x-6)(x+3)}-\dfrac{x+1}{(x+6)(x-6)}\cdot\dfrac{(x+3)}{(x+3)}$

	x	$+3$
x	x^2	$+3x$
$+1$	$+x$	$+3$

$=x^2+4x+3$

$$\frac{5x^2+30x-(x^2+4x+3)}{(x+6)(x-6)(x+3)}=\frac{4x^2+26x-3}{(x\pm6)(x+3)}$$