HW-Tally

Pick up the Warm Up

1 Use "Completing the Square" to solve the two quadratic equations

a) $x^2 + 14x - 15 = 0$

$\left(\frac{14}{2}\right)^2 = 49$

$x^2 + 14x + 49 = 15 + 49$

$(x+7)^2 = 64$

$\sqrt{\quad}$ $\sqrt{\quad}$

$x + 7 = \pm 8$

$x + 7 = 8$ $\qquad$ $x + 7 = -8$

$x = 1$ $\qquad$ $x = -15$

b) Now, a bit tougher:
Keep all values exact, no decimals.

$x^2 + 3x - 5 = 0$

$x^2 + 3x + \frac{9}{4} = 5 + \frac{9}{4}$

$\left(\frac{3}{2}\right)^2 = \frac{9}{4}$

$\left(x + \frac{3}{2}\right)^2 = \frac{29}{4}$

$\frac{5}{1}\cdot\frac{(4)}{(4)} + \frac{9}{4}$

$\frac{20+9}{4} = \frac{29}{4}$

$x + \frac{3}{2} = \pm\sqrt{\frac{29}{4}}$

$\frac{\sqrt{29}}{\sqrt{4}}$ $\frac{\sqrt{29}}{2}$

$x + \frac{3}{2} = \frac{\sqrt{29}}{2}$ $x + \frac{3}{2} = -\frac{\sqrt{29}}{2}$

$x = -\frac{3}{2} + \frac{\sqrt{29}}{2}$ $x = -\frac{3}{2} - \frac{\sqrt{29}}{2}$

$x = \frac{-3+\sqrt{29}}{2}$ $\frac{-3-\sqrt{29}}{2}$

2 Divide the Fractions

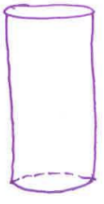
a) $\dfrac{\frac{3}{2y}}{\frac{6}{x}} = \dfrac{3}{2y} \cdot \dfrac{x}{6} = \dfrac{x}{4y}$

b) $\dfrac{3}{1-\frac{1}{2y}} = \dfrac{\frac{3}{1}}{\frac{1(2y)}{1(2y)} - \frac{1}{2y}} = \dfrac{\frac{3}{1}}{\frac{2y-1}{2y}}$

called a complex fraction

$= \dfrac{3}{1} \cdot \dfrac{2y}{2y-1} = \dfrac{6y}{2y-1}$

(3) Cylinder



$V = \pi r^2 h$

$SA = 2\pi r^2 + 2\pi r h$

Volume to Surface Area Ratio:

$\dfrac{V}{SA} = \dfrac{\pi r^2 h}{2\pi r^2 + 2\pi r h}$

$$\frac{\pi r^2 h}{2\pi r^2 + 2\pi rh} \rightarrow \frac{\pi r^2 h}{2 \cdot \pi \cdot r (r+h)}$$

$$\frac{rh}{2(r+h)}$$

Check work from HW

(Any questions ?)

11 3b $\dfrac{x^2-x-12}{3x^2-11x-4} \cdot \dfrac{3x^2-20x-7}{x^2-9}$

$= \dfrac{(x+3)(x-4)}{(3x+1)(x-4)} \cdot \dfrac{(3x+1)(x-7)}{(x+3)(x-3)}$

11 3c $\dfrac{2x^2+8x-10}{2x^2+15x+25} \div \dfrac{4x^2+20x-24}{2x^2+x-10}$

Issues if you don't factor out 2 first

Issues if you don't factor out 4 first

$\dfrac{2(x^2+4x-5)}{(2x+5)(x+5)} \div \dfrac{4(x^2+5x-6)}{(\quad)(\quad)} = \dfrac{2(x+5)(x-1)}{(2x+5)(x+5)} \cdot \dfrac{4(x-2)(x-3)}{(2x+5)(x-2)}$

113 c

$$\frac{2x^2+8x-10}{2x^2+15x+25} \div \frac{4x^2+20x-24}{2x^2+x-10}$$

Issues if you don't factor out 2 first

Issues if you don't factor out 4 first

$$\frac{2(x^2+4x-5)}{(\quad)(\quad)} \div \frac{4(x^2+5x-6)}{(\quad)(\quad)} = \frac{2(x-1)(x+5)}{(2x+5)(x+5)} \div \frac{4(x-1)(x+6)}{(2x+5)(x-2)}$$

$$\frac{2(x-1)}{2x+5} \cdot \frac{(2x+5)(x-2)}{4(x-1)(x+6)}$$

$$\frac{x-2}{2(x+6)}$$

113 d $\frac{7}{x+5} - \frac{4-6x}{x^2+10x+25} \Rightarrow \frac{7}{x+5} - \frac{2(2-3x)}{(x+5)(x+5)}$

$\frac{7}{(x+5)}\frac{(x+5)}{(x+5)} - \frac{2(2-3x)}{(x+5)(x+5)} \Rightarrow \frac{7(x+5) - 2(2-3x)}{(x+5)(x+5)}$

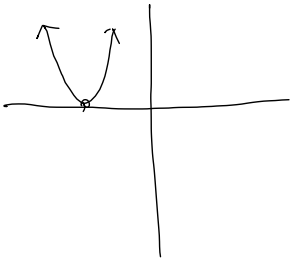
$\frac{7x+35 - 4 + 3x}{(x+5)(x+5)} \Rightarrow \frac{10x + 31}{(x+5)(x+5)}$

116 $g(x) = 2(x+3)^2$

$a+1$

$g(-5) =$

$g(a+1)$



$g(x) = 32$

$\frac{32}{2} = \frac{2(x+3)^2}{2}$

$(x+3)^2 = 16$

$\sqrt{\quad}$ $\sqrt{\quad}$

# B.B.

117 $x^2 + 14x + 33 = 0$

$(x+11)(x+3) = 0$

See your LCQ

② $\dfrac{3a^2 - 3b^2}{b-a}$ ← missing $^2$

$$\frac{3(a^2-b^2)}{b-a} = \frac{3(a+b)(a-b)}{b-a}$$

$-(a-b)$

$\dfrac{3(a+b)}{-1}$ $-3(a+b)$

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

$$\frac{10 + x+1}{5x} \qquad \frac{x+11}{5x}$$

$$\frac{x}{3x+9} - \frac{3}{x^2+3x}$$

$$\frac{x}{3(x+3)} - \frac{3}{x(x+3)}$$

$$\frac{-}{3 \bullet x \bullet (x+3)}$$

Today's AIM

Become proficient with adding, subtracting, multiplying, and dividing rational expressions.

## Practice Worksheet

- Check answers often
- Be organized
- Don't skimp on good notation
- Factor **ASAP**
- Do box/diamond work on scratch paper

Answers:

(1) $\frac{1}{2x-1}$ but $x \neq 0$ $x \neq \frac{1}{2}$

(2) $z-7$ but $z \neq -7$

(3) $\frac{2}{x+5}$ but $x \neq -5$

(4) $\frac{7}{15n^2}$

(4) $\frac{7}{15n^2}$ (5) $\frac{4(x+6)}{3(3x+8)}$ or $\frac{4x+24}{9x+24}$

(6) $\frac{5(x+y)}{3}$

(7) $\frac{3n^2+30}{20n}$

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

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

(9) $\frac{2m^2-5m-3}{(2m+1)^2}$ <.... can't be factored

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

Assignment

**3 .... 120-121, 123-126**