Mon. wk 2

Recall

$(A^b)^c = A^{bc}$

warm-up

Simplify:

① $\dfrac{z^{x-3}}{z^{2-x}} = z^{x-3} \cdot z^{\overbrace{-(2-x)}^{-2+x}}$

$= z^{x-3+-(2-x)}$

$= z^{x-3-2+x}$

$= z^{2x-5}$

② $\left(\dfrac{a^3 b^2 c^{-1}}{b^2 a^4 c}\right)^{-5} = \left(\dfrac{a^3 c^{-1}}{a^4 c}\right)^{-5} =$

$= \left(\dfrac{a^4 c}{a^3 c^{-1}}\right)^5 = \dfrac{a^{20} c^5}{a^{15} c^{-5}} = a^5 c^{10}$

$(ac^2)^5$

Domain:

#1

$$f(x) = \frac{4}{3/x + 1}.$$

① $\frac{3}{x} + 1 = 0$

common denom $\frac{3}{x} + \frac{x}{x} = 0$

$\frac{3+x}{x} = 0$

cross mult $3 + x = 0$

$x = -3$

$\mathbb{R} - \{-3\}$

or in interval notation

$(-\infty, -3) \cup (-3, \infty)$

(-inf ,-3) U (-3, inf)

Note: there are two denominators!

Also $x \neq 0$

$(-\infty, -3) \cup (-3, 0) \cup (0, \infty)$

#14

Find the equations of the lines that pass through the point $(4,8)$ and are parallel to and perpendicular to the line with equation $y+2x=2$.

Parallel: $y=$

Perpendicular: $y=$

Solution:

Given line: $y+2x=2$

it's slope is -2 : $y=-2x+2$

Now: slope $=-2$

point $=(4,8)$

perpendicular slope $\frac{-1}{-2}=\frac{1}{2}$

I. $y-y_1=m(x-x_1)$; $y_1 = 8$, $m = -2$, $x_1 = 4$

$y-8=-2(x-4)$

$y=-2x+16$

II. Perpendicular, same point, but $m=\frac{1}{2}$

$y-8=\frac{1}{2}(x-4)$

$y=\frac{1}{2}x+6$

#37

F	$(x+y)^2 = x^2 + y^2.$	Freshman's Dream — exponents do not play nicely with + or -
T	$(x+y)^2 = x^2 + 2xy + y^2.$	
F	$\frac{x}{x+y} = \frac{1}{y}.$	
F	$x - (x+y) = y.$	
F	$\sqrt{x^2} = x.$	$\sqrt{(-16)^2} \stackrel{?}{=} -16$
T	$\sqrt{x^2} = \lvert x \rvert.$	$\sqrt{(-16)^2} = \lvert -16 \rvert$
F	$\sqrt{x^2+4} = x + 2.$	exponents do not play nicely with + or -
F	$\frac{1}{x+y} = \frac{1}{x} + \frac{1}{y}.$	try some samples