Math 126, in-class exercise 1 on algebra: Name: _____

Typically, I'll work a similar example, then I'll pause to let you work out one of these. At the end of class these will be collected and you will earn a grade on the basis of your participation. Solutions will be posted in BB.

1.) Let $f(x) = x^2 - 6x + 1$. Solve $f(x) = 0$ by the quadratic formula. Also, use these solutions to factor $f(x)$.

$a = 1$, $b = -6$, $c = 1$

$$x = \frac{6 \pm \sqrt{36-4}}{2} = \frac{6 \pm \sqrt{32}}{2} = \frac{6 \pm 2\sqrt{8}}{2} = \boxed{3 \pm \sqrt{8}}$$

Thus $f(x) = (x - 3 - \sqrt{8})(x - 3 + \sqrt{8})$.

2.) Rationalize the denominator of $\left(\frac{x+2}{3+\sqrt{x-2}}\right)\left(\quad\right)$.

$$\frac{x+2}{3+\sqrt{x-2}}\left(\frac{3-\sqrt{x-2}}{3-\sqrt{x-2}}\right) = \frac{3x+6-x\sqrt{x-2}-2\sqrt{x-2}}{9+3\sqrt{x-2}-3\sqrt{x-2}-(\sqrt{x-2})^2}$$

$$= \frac{3x+6-x\sqrt{x-2}-2\sqrt{x-2}}{9-(x-2)}$$

$$= \boxed{\frac{3x+6-x\sqrt{x-2}-2\sqrt{x-2}}{11-x}}$$

3.) Find the equation of a line (name it Sammy) through (1,2) and (-3,7). Then find the equation of a second line which is perpendicular to Sammy and has a y-intercept of 2.

$$m = \frac{7-2}{-3-1} = \frac{5}{-4} \Rightarrow y = 2 + \left(\frac{-5}{4}\right)(x-1)$$

$$\boxed{y = 2 - \frac{5}{4}(x-1) = \frac{13}{4} - \frac{5}{4}x}$$

$$y_\perp = 2 + \frac{4}{5}x$$

4.) Suppose $F(x) = \frac{1}{\sqrt{9-x}}$. Find the domain of F

need $9 - x > 0 \Rightarrow 9 > x \Rightarrow \boxed{(-\infty, 9)}$