

Group #: _____ Name: _____

1. (30 points) Find an equation of the line that satisfies the given conditions. Express your answer in the slope-intercept form.

(a) x -intercept $(-8, 0)$; y -intercept $(0, 6)$

(b) Through $(-2, 5)$ and $(-1, -3)$

(c) Through $(-1, 3)$ and perpendicular to $3x + 6y = 9$

2. (20 points) The manager of a furniture factory finds that it costs \$2200 to manufacture 100 chairs in one day and \$4800 to produce 300 chairs in one day.

(a) Assuming that the relationship between cost and the number of chairs produced is linear, find an equation that expresses this relationship. Then graph the equation.

(b) In your own words, describe what the slope in your linear model means in this context. Be sure to use the actual number in your description.

(c) In your own words, describe what the y -intercept in your linear model means in this context. Be sure to use the actual number in your description.

3. (30 points) Find the domain of the following functions. Express your answers in either set-builder notation or interval notation (depending on whichever is more convenient/appropriate).

(a) $f(x) = \frac{x + 2}{x^2 - 1}$

(b) $myf(x) = \sqrt{x - 5}$

(c) $urf(x) = \frac{\sqrt{2 + x}}{3 - x}$

4. (20 points) Find the *difference quotient*, $\frac{f(a + h) - f(a)}{h}$, of the following functions. Assume $h \neq 0$. Please simplify your answers completely.

(a) $f(x) = 3 - 5x - 4x^2$

(b) $f(x) = \frac{2x}{x - 1}$