Math 151
Quiz 1
Fall 2008

Justify all answers with neat and organized work. Clearly indicate your answers. 20 points possible.

1. (5 pts.) Find the equation of the line that satisfies the given conditions.

Through $(2, -7)$, parallel to the line $x + 3y = 12$

2. (5 pts.) The graph of $y = f(x)$ is given on the supplemental page. Match each equation with its graph.

(a) $y = -f(x + 4)$

(b) $y = 2f(x + 6)$

(c) $y = f(x) + 3$

(d) $y = f(x - 4)$

(e) $y = \frac{1}{3}f(x)$

3. (5 pts.) The daily profit from the sale of a product is given by

$$P = 400x - 4x^2 - 3600 \quad \text{dollars},$$

where the level of production is x units.

Use the formula for the derivative of a quadratic function to answer the following questions.

(a) What level of production maximizes profit?

(b) What is the maximum possible profit?

4. (5 pts.) Use the "four-step process" to find the derivative $f'(x)$, given

$$f(x) = x^4.$$

Use the formula $\frac{f(x+h)-f(x)}{h}$ for the secant slope, simplify, let h tend to 0, and write down $f'(x)$.