

**Math 148 Quiz #1**  
**June 29, 2010**

Name: \_\_\_\_\_

Show all work and answers on a separate sheet with a box around your final answer. Calculators are allowed.

1. A small company producing “I ♥ Math” t-shirts has fixed costs of \$2,480 and variable costs of \$4 per shirt. The company sells the shirts for \$12 each.

- (a) (3 pts.) Find the total cost  $C(q)$  and total revenue  $R(q)$  of producing and selling  $q$  shirts.
- (b) (3 pts.) Find the break-even quantity,  $q_0$ , for the company.
- (c) (1 pt.) Find the marginal cost and the marginal revenue for the company.

2. The function  $f(x)$  is given in the figure below.

- (a) (4 pts.) For each of the following pairs, which quantity is larger?
  - i.  $f(1)$  or  $f(6)$ ?
  - ii.  $f'(1)$  or  $f'(6)$ ?
- (b) (2 pts.) Approximate the interval(s) for which  $f$  is concave up.
- (c) (2 pts.) Find the average rate of change of  $f(x)$  between  $x = 0$  and  $x = 5$ .
- (d) (2 pts.) On the graph to the right, draw the tangent line to  $f(x)$  at  $x = 4$ . Approximate  $f'(4)$ . Clearly show your calculations.
- (e) (3 pts.) Sketch a rough graph of  $f'(x)$ . You do not need a scale on the  $y$ -axis, but be sure to put a scale on the  $x$ -axis.

