

**Math 171 - Quiz 5**

September 30, 2010

Name \_\_\_\_\_

Score \_\_\_\_\_

Show all work to receive full credit. Supply explanations when necessary.

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1. (2 points) The following table gives information about the functions  $f$  and  $g$ .

| $x$ | $f(x)$ | $f'(x)$ | $g(x)$ | $g'(x)$ |
|-----|--------|---------|--------|---------|
| 0   | -7     | 0       | 4      | 2       |
| 1   | -8     | -1      | 7      | 5       |
| 2   | -7     | 4       | DNE    | DNE     |
| 3   | 2      | 15      | 1      | 5       |

Use this information to find an equation of the line tangent to the graph of  $y = f(x)g(x)$  at the point where  $x = 1$ .

2. (3 points) An object is thrown straight up from over the side of a 110-ft building. If the object's initial velocity is 50 ft/sec, how high will it go and when will it land on the ground.

3. (1 point) Find  $f''(x)$  if  $f(x) = 8 \sec x$ .

4. (3 points) Find each derivative.

(a)  $\frac{d}{dx} \tan(3\pi x^2)$

(b)  $\frac{d}{dr} \sin^2(2\pi r + 1)$

5. (1 point) Find the rate of change of  $g(x) = \frac{\sqrt{x} + 6}{x^2 - 5x}$  at the point  $(4, -2)$ .