MATH 2554 Quiz 6 (Sections 3.4, 3.5, and 3.6)
Due Tuesday, Feb. 24

This quiz is due Tuesday, Feb. 24 at the beginning of your drill. You may use your brain, notes, book, other humans and any pet of your choice. **Your solutions must be legible, in order, stapled, de-fringed, and with your name on the top right corner of the each page.** If you fail to meet any of these requirements you will receive a zero. Each question is worth one point and is all or nothing.

1. Evaluate analytically: $\lim\limits_{x \to 0} \dfrac{\sin(6x)}{\sin x}$

2. Use the quotient rule to show that $\dfrac{d}{dx}(\cot(x)) = -\csc^2(x)$.

The function $s(t) = 2t^3 - 21t^2 + 60t$ models the position of an object in feet, where t is in seconds and $0 \le t \le 6$.

3. Find the velocity function for this object, and sketch its graph (for $0 \le t \le 6$). Be sure to indicate the coordinates of its x-intercepts and its vertex.

4. At what times is the object stationary? At what time does the object attain its minimum velocity? Justify your answers using the graph of the velocity function.

5. Find the acceleration function for this object and sketch its graph. Indicate the coordinates of its x-intercept and y-intercept.

Find dy/dx for each of the following functions.

6. $y = (1 + \cos x)(\sin x)$

7. $y = (7x^3 - 2x)^{-2}$

8. $y = \sqrt{\sin x + \tan x}$

9. $y = e^{\cos 3x}$

10. $y = (x + e^{x^2})^4$