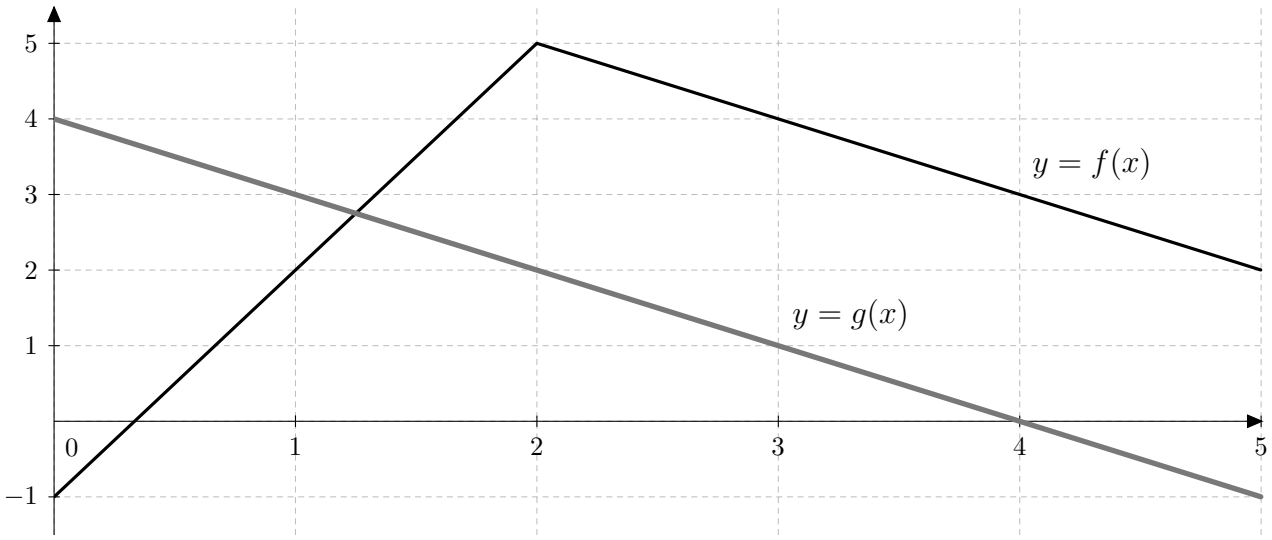
Name _____ Rec. Instr._____
Signature _____ Rec. Time_____

Math 220
Exam 2
March 1, 2012

No books, calculators, or notes are allowed. Please make sure that your cell phone is turned off. You will have 75 minutes to complete the exam. Unless instructed otherwise, show your work on each problem.

Problem	Points	Points Possible	Problem	Points	Points Possible
1		15	5		20
2		5	6		10
3		30	7		10
4		10	Total Score		100



1. (5 points each) For the graph above, calculate the following quantities.

A. $a'(1)$ if $a(x) = f(x)g(x)$

B. $b'(1)$ if $b(x) = \dfrac{f(x)}{g(x)}$

C. $c'(1)$ if $c(x) = f\left(g(x)\right)$

2. (5 points) Let $T(t)$ denote the temperature in degrees Fahrenheit of a cold can of soda t minutes after removing it from a refrigerator on a warm day. Is $T'(2)$ positive or negative? Explain your answer.

3. (5 points each) Differentiate the following functions. You do not need to simplify your answers or show your work. However, showing your work may help you earn partial credit if your answer is incorrect.

A. $k(x) = 5x^3 + 3\sqrt{x} + \dfrac{2}{x}$

B. $w(x) = \ln(x) + 3^x$

C. $v(x) = \cos(x)\sin(x)$

D. $p(x) = \dfrac{\tan(x)}{2e^x + 7}$

E. $u(x) = \cos\left(\sec(x)\right)$

F. $r(x) = x\tan^{-1}(x^3)$ (Recall that $\tan^{-1}(y) = \arctan(y)$.)

4. (10 points) Let $z(t) = 3t^2 + t$. Using the limit definition of the derivative, find $z'(1)$.

5. (10 points each) Find $\dfrac{dy}{dx}$ if:

A. $x^3 + xy + y^4 = 5$

B. $y = (x^2 + 1)^5 x^{\sin(x)}$

6. (10 points) Find the equation of the tangent line to the curve $y = e^{2x}$ at the point $(0, 1)$.

7. (10 points) Sketch the graph of $y = q'(x)$ in the empty plot at the bottom of the page.