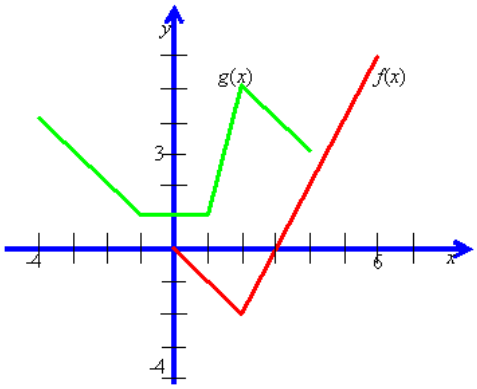
Math 123 Exam 2A

November 10, 2010 Professor Ilya Kofman

NAME: _____



1. Evaluate each expression using the graph above.

(a) $(f+g)(3) =$_____

(b) $(fg)(1) =$_____

(c) $(g \circ f)(4) =$_____

(d) $(f \circ g \circ f)(4) =$_____

(f) Does $f(x)$ have an inverse for all x? **Y** **N**

(g) Does $g(x)$ have an inverse for all x? **Y** **N**

2. You want to fence off a rectangular garden adjacent to a barn (with no fence along the barn). Find the area of the largest garden possible with 80 ft of fencing.

. Area = _____

3. If $f(x) = x^2 - 8$ and $g(x) = \sqrt{x+5}$, find the following.

(a) $f \circ g$

(b) $g \circ f$

(c) $g(f(2))$

4. Find the inverse of $f(x) = \sqrt{5-3x}$. $f^{-1}(x) =$_____

5. Find the inverse of $f(x) = \ln(x/3)$. $f^{-1}(x) =$_____

6. Evaluate the following expressions.

(a) $\log_4 80 - \log_4 5$

(b) $\log_8 4$

(c) $\ln \frac{e^3}{\sqrt{e}}$

7. Combine into a single logarithm: $\ln(5x) + 3\ln(x^2+1) - \frac{1}{2}\ln(3x-1)$

8. If $\ln a = 4,\ \ln b = -8,\ \ln c = 6,$ evaluate the following expressions.

(a) $\ln \dfrac{a^5}{b^2c^3}$

(b) $\ln(a\sqrt{bc})$

(c) $\ln\,(a/e)$

9. Solve the following equations.

(a) $6^{x+2} = 4^{5x}$

(b) $\log_3(11 + 2x) = 4$

(c) $4\ln(6 - x) = 3$

10. Suppose \$5,000 is invested in an account paying 4.5% interest per year (APR).

(a) Find the amount in the account after 6 years if interest is compounded monthly.

(b) How long will it take for the account to have \$8,000 if interest is compounded semiannually?

(c) Find the amount in the account after 6 years if interest is compounded continuously.

(d) How long will it take for the account to have \$8,000 if interest is compounded continuously?