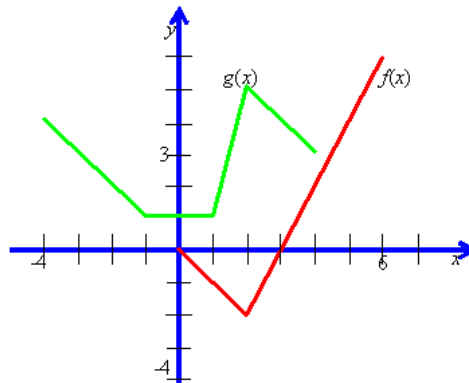


Math 123 Exam 2B

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1. Evaluate each expression using the graph above.

(a)  $(f + g)(2) =$  \_\_\_\_\_

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

(b)  $(fg)(2) =$  \_\_\_\_\_

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

(c)  $(g \circ f)(3) =$  \_\_\_\_\_

(d)  $(f \circ g \circ f)(3) =$  \_\_\_\_\_

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 100 ft of fencing.

Area = \_\_\_\_\_

3. If  $f(x) = x^2 - 7$  and  $g(x) = \sqrt{x + 3}$ , find the following.

(a)  $f \circ g$

(b)  $g \circ f$

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

4. Find the inverse of  $f(x) = \sqrt{7 - 4x}$ .  $f^{-1}(x) =$  \_\_\_\_\_

5. Find the inverse of  $f(x) = \ln(x/2)$ .  $f^{-1}(x) =$  \_\_\_\_\_

6. Evaluate the following expressions.

(a)  $\log_2 80 - \log_2 5$

(b)  $\log_4 8$

(c)  $\ln \frac{e^5}{\sqrt{e}}$

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

8. If  $\ln a = 7$ ,  $\ln b = -4$ ,  $\ln c = 8$ , evaluate the following expressions.

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

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

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

9. Solve the following equations.

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

(b)  $\log_4(12 + 2x) = 3$

(c)  $5 \ln(4 - x) = 3$

**10.** Suppose \$4,000 is invested in an account paying 6.5% interest per year (APR).

(a) Find the amount in the account after 7 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 7 years if interest is compounded continuously.

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