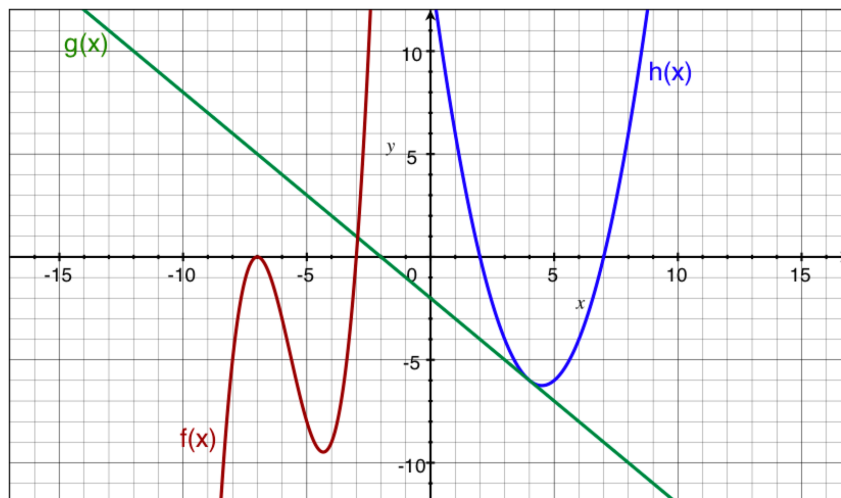


Sample Problems for Exam 2

College Algebra and Trigonometry, Math 123, Section 3260, Fall 2011

- Exam 2 will be held in class on Wednesday Nov 9th.
- Syllabus for Exam 2: 2.6, 2.7, 2.8, 4.1, 4.2, 4.3
- Review for Exam 2 will be held on Monday Nov 7th.



1. Evaluate each expression using the graph above.

(a) $(g + h)(2) = \underline{\hspace{2cm}}$	(f) Does $f(x)$ have an inverse for all x ? Y N
(b) $(gh)(3) = \underline{\hspace{2cm}}$	(g) Does $g(x)$ have an inverse for all x ? Y N
(c) $(g \circ h)(3) = \underline{\hspace{2cm}}$	(h) Does $h(x)$ have an inverse for all x ? Y N
(d) $(h \circ g \circ f)(-8) = \underline{\hspace{2cm}}$	(i) Does $h(x)$ have an inverse for $x > 5$? Y N

2. If $f(x) = x^2 + 1$ and $g(x) = x - 3$, find the following (if impossible, write "DNE").

(a) $f \circ g$	(b) $g \circ f$	(c) $g(f(2))$	(d) $g \circ g \circ g$	(e) $g^{-1}(x)$	(f) $f^{-1}(x)$
-----------------	-----------------	---------------	-------------------------	-----------------	-----------------

3. Find two positive numbers whose sum is 60 and the sum $2x^2 + y^2$ is a maximum.
4. A farmer has 1200 ft of fencing and wants to fence off a rectangular field that borders a straight river. He does not need to fence along the river. What are the dimensions of the field of largest area that he can fence ?
5. Find the area of the largest rectangle that can be inscribed between the axes and $y = 6 - 3x$. (Hint: Draw the line first.)
6. Find the inverse of $f(x) = (x + 5)^3$. $f^{-1}(x) = \underline{\hspace{2cm}}$

7. Find the inverse of $f(x) = e^{3x}$. $f^{-1}(x) =$ _____
8. Evaluate the following expressions.
 (a) $\log_6 4 + \log_6 9$ (b) $\log_3 \sqrt{27}$ (c) $\log_{\sqrt{3}} 27$ (d) $\ln \frac{1}{\sqrt{e}}$
9. If $\ln a = 3$, $\ln b = 4$, $\ln c = -5$, evaluate the following expressions.
 (a) $\ln \frac{a^3}{b^2}$ (b) $\ln \sqrt{abc}$ (c) $\ln (be)$
10. Combine into a single logarithm: $\ln x - 3 \ln(x^2 + 1) + \frac{1}{2} \ln(x + 5)$
11. Suppose \$7,000 is invested in a savings account paying 3.5% interest per year (APR).
 (a) Find the amount in the account after 12 years if interest is compounded monthly.
 (b) How long will it take for the account to have \$10,000 if interest is compounded semiannually?
 (c) Find the amount in the account after 12 years if interest is compounded continuously.
 (d) How long will it take for the account to have \$10,000 if interest is compounded continuously?