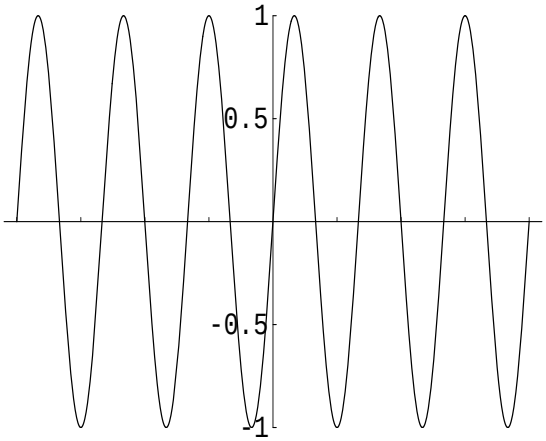
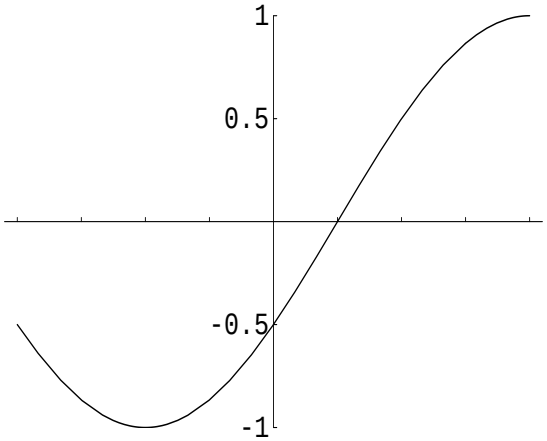
Math 125.01
Lab 2 - Review
January 29, 2008

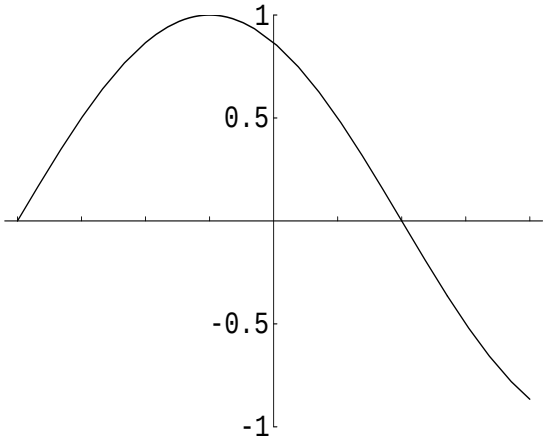
Name:_____

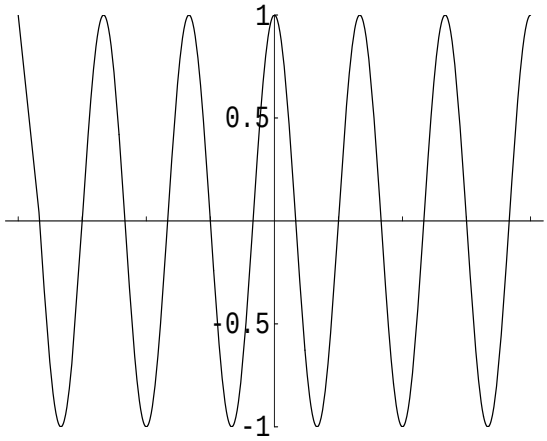
1. (a) Use logarithm properties to write the expression $3\ln(x^3y)+2\ln(y/z^2)$ as a single logarithm.
   (b) Solve the following equation for x: $\frac{1}{2}\ln(x+3)-\ln x=0$.
   (c) Solve the following equation for x: $2\cdot 5^{x/4}=240$.

2. Determine which of the following graphs matches each given equation.

i)


ii)


iii)


iv)


(a) $y=\cos\frac{1}{3}\left(x+\frac{\pi}{2}\right)$
(b) $y=\sin\frac{1}{3}\left(x-\frac{\pi}{2}\right)$
(c) $y=\sin 3\left(x-\frac{\pi}{2}\right)$
(d) $y=\cos 3\left(x+\frac{\pi}{2}\right)$

3. Find the **exact** value of each expression.

(a) $\sec\left(\frac{\pi}{4}\right)$
(b) $\arcsin\left(-\frac{\sqrt{3}}{2}\right)$
(c) $\arccos\left(\sin\left(\frac{\pi}{3}\right)\right)$
(d) $\tan\left(\sin^{-1}\left(\frac{\sqrt{2}}{2}\right)\right)$

4. Assume that $\cos t = -\frac{1}{2}$ and $\frac{\pi}{2} < t < \pi$. Determine the following.

   a) $\sin t$ b) $\tan t$
   c) $\sec t$ d) $\csc t$

5. If $\cos t = -\frac{4}{5}$ and $\frac{\pi}{2} < t < \pi$, determine the following:

   (a) $\cos 2t$ (b) $\sin 2t$
   (c) $\sin(t/2)$

6. Below is a list of some "simple" algebra problems. Some of the solutions are correct and some of them are wrong! For each problem:

   (A) determine if the answer is correct;

   (B) determine if there are any mistakes made in solving the problem and list them (Note that just because the answer is correct does not mean there are no mistakes);

   (C) if the answer to (A) or (B) is **NO**, redo the problem correctly; if the answers to (A) and (B) are **YES**, devise a correct method to solve the problem.

   (a) $\frac{x^2-1}{x+1} = \frac{x^2+(-1)}{x+1} = \frac{x^2}{x} + \frac{-1}{1} = x - 1$

   (b) $(x+y)^2 - (x-y)^2 = x^2 + y^2 - x^2 - y^2 = 0$

   (c) $\frac{9(x-4)^2}{3x-12} = \frac{3^2(x-4)^2}{3x-12} = \frac{(3x-12)^2}{3x-12} = 3x - 12$

   (d) $\frac{x^2y^5}{2x^{-3}} = x^2y^5 * 2x^3 = 2x^6y^5$

   (e) $\frac{(2x^3+7x^2+6)-(2x^3-3x^2-17x+3)}{(x+8)+(x-8)} = \frac{(2x)^2-17x+9}{2x} = 2x-17x+9 = -15x+9 = -6x$

   (f) $\frac{x^{-1}+y^{-1}}{x^{-1}-y^{-1}} = \frac{(x+y)^{-1}}{(x-y)^{-1}} = (\frac{x+y}{x-y})^{-1} = -\frac{x+y}{x-y} = \frac{x+y}{y-x}$

7. Find the domain of each of the following functions.

   (a) $f(x) = 2x + 10$

   (b) $f(x) = \frac{x+4}{2x+10}$

   (c) $f(x) = \sqrt{2x+10}$

   (d) $f(x) = \sqrt{x(x+3)(2x+5)}$

8. For each of the following, find functions f and g such that $h = f \circ g$.

   (a) $h(x) = \frac{1}{(x^2+5x-2)^4}$

   (b) $h(x) = \sqrt{x^2+9}$