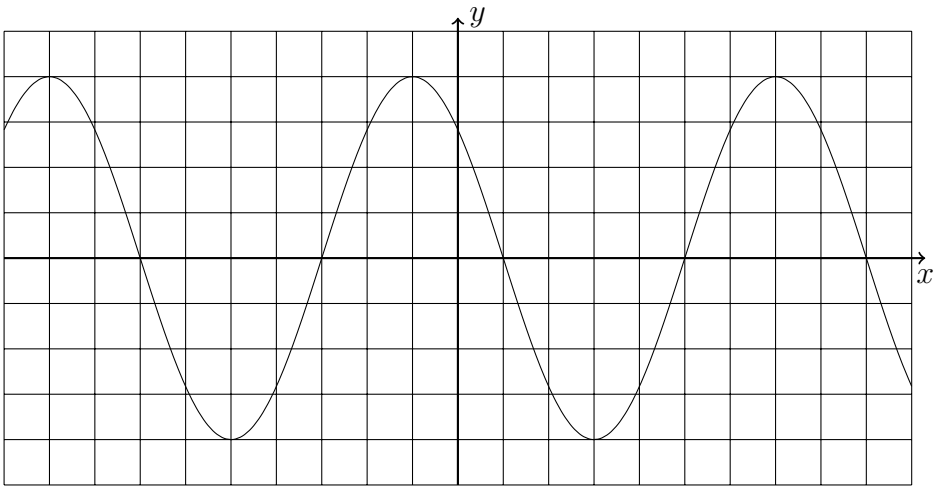
Math 130 Precalculus Fall 14 Sample midterm 3

1. Find $\log_5(3)$ to three decimal places.
2. Solve
   (a) $\ln(2x+3) = \ln(x) + 4$
   (b) $2e^x - 3e^{-x} = 2$
   (c) $\dfrac{3}{1+e^{-2x}} = 1$
   (d) $4\tan x - \sec^2 x = 0$
   (e) $\sin(2x)\cos(x) - \cos(2x)\sin(x) = 0$
   (f) $\sin(4x) - \cos(2x) = 0$
3. Find the point on the unit circle
   (a) corresponding to the terminal point for $t = -11\pi/4$.
   (b) whose x-coordinate is $-3/7$ and whose y-coordinate is positive.
4. Find the exact value of
   (a) $\sec(-17\pi/6)$
   (b) $\cos^{-1}(-\sqrt{2}/2)$
   (c) $\sin^{-1}(\sin(-5\pi/3))$
   (d) $\sec(\tan^{-1}(3/2))$
   (e) $\cos(5\pi/12)$
5. Write $\cot(t)$ in terms of $\sin(t)$ in quadrant IV.
6. If $\tan(t) = 3$ and t is in quadrant II find the values of the other trig functions at t.
7. Find the amplitude, frequency and phase shift for $y = 4\cos(3x + \pi/5)$, and draw a careful graph of the function.
8. The diameter of the clock face in the Westminster clock tower is 7m, and the bottom of the clock face is 47m above the ground. Find a formula for the height of the minute hand above the ground.
9. Find an equation describing the following graph.



10. Verify:

(a) $\dfrac{1+\cos x}{\sin x} = \dfrac{\sin x}{1-\cos x}$

(b) $\tan x + \cot x = \sec x \csc x$

(c) $2\csc(2x)\tan(x) = \sec^2(x)$