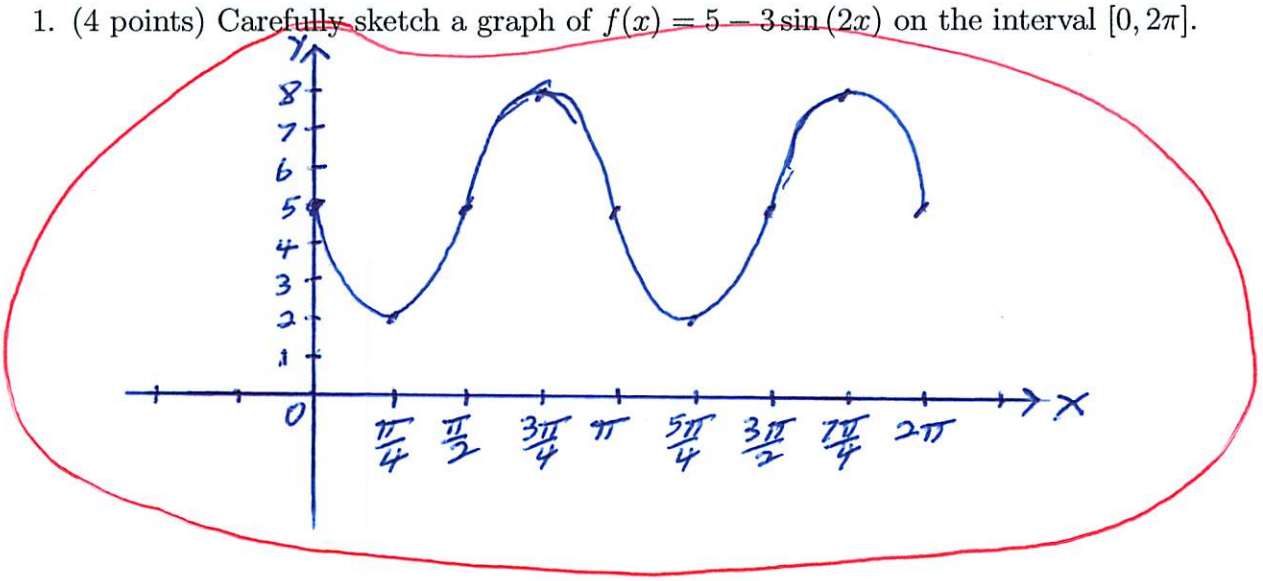
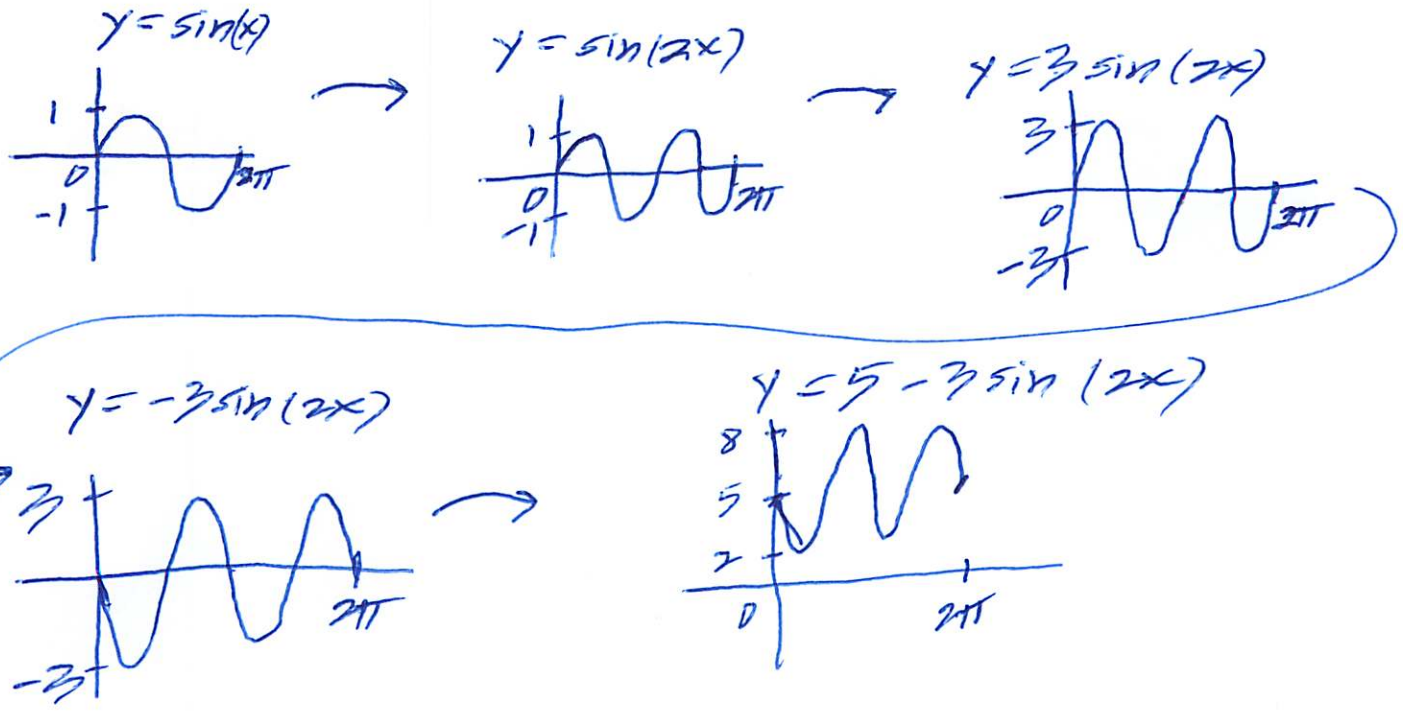
Math 220 (section AD?) **Quiz 1** **Fall 2013**

Name Solutions

- You have 15 minutes
- No calculators
- Show sufficient work

1. (4 points) Carefully sketch a graph of $f(x) = 5 - 3\sin(2x)$ on the interval $[0, 2\pi]$.





2. (3 points) Determine the domain of the given function.

$$f(x) = \frac{2}{1 - \sqrt{3 - \sqrt{x+4}}}$$

$x+4 \geq 0 \Rightarrow x \geq -4$

$3 - \sqrt{x+4} \geq 0 \Rightarrow 3 \geq \sqrt{x+4} \Rightarrow 9 \geq x+4 \Rightarrow 5 \geq x$

denominator equals 0 when

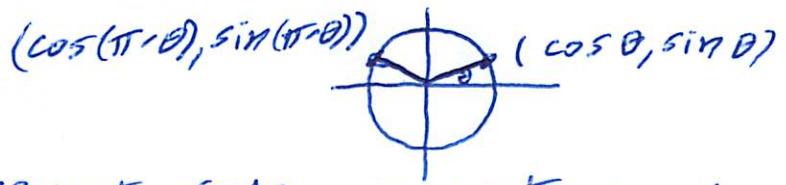
$1 - \sqrt{3 - \sqrt{x+4}} = 0 \Rightarrow 1 = \sqrt{3 - \sqrt{x+4}} \Rightarrow 1 = 3 - \sqrt{x+4} \Rightarrow$

$\sqrt{x+4} = 2 \Rightarrow x+4 = 4 \Rightarrow x = 0$

Thus $x \neq 0$, $x \geq -4$ and $5 \geq x$

domain (f): $[-4, 0) \cup (0, 5]$

3. (3 points) Suppose $0 < \theta < \pi/2$ and $\sec\theta = 4$. What is the value of $\cot(\pi - \theta)$? Do not use inverse trigonometric functions in your answer.



From the unit circle, we get $\cos(\pi-\theta) = -\cos\theta$

and $\sin(\pi-\theta) = \sin\theta$

$$\cot(\pi-\theta) = \frac{\cos(\pi-\theta)}{\sin(\pi-\theta)} = \frac{-\cos\theta}{\sin\theta}$$

$$= \frac{-1/4}{\sqrt{1-(1/4)^2}}$$

$$= \frac{-1/4}{\sqrt{15}/4}$$

$$= -1/\sqrt{15}$$

note:

$\sec\theta = 4 \Rightarrow$

$1/\cos\theta = 4 \Rightarrow$

$\cos\theta = 1/4$

since $\sin^2\theta + \cos^2\theta = 1$

and $0 < \theta < \pi/2$

we get

$\sin\theta = \sqrt{1-(1/4)^2}$