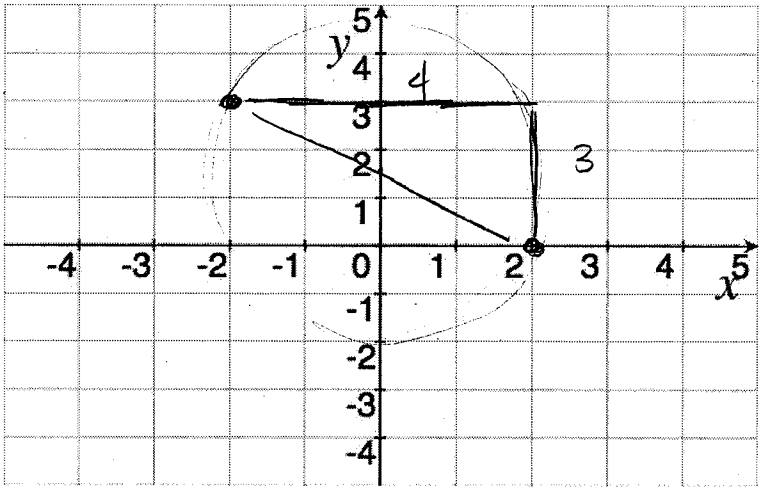
Quiz 4

Key

Show *all* your work. No credit is given without reasonable supporting work. There are *two* sides to this quiz.

1. [3] (WebHW10 #6)
Let A be the point at $(-2, 3)$ and B be the point at $(2, 0)$ Find the equation of a circle with endpoints of a diameter at A and B.



Center = midpt of $\overline{AB}$

$= \left(\frac{2+-2}{2}, \frac{3+0}{2}\right) = (0, 1.5)$ (+.5)

Radius = $\frac{1}{2}$ length of $\overline{AB}$

$= \frac{1}{2}\sqrt{3^2+4^2}$

$= \frac{1}{2}\sqrt{9+16}$ (+.5)

$= 5/2$ (+.5)

So $(x-h)^2 + (y-k)^2 = r^2$ (+.5)

$(x-0)^2 + (y-1.5)^2 = (5/2)^2$ (+1)

2. Let $\cos\theta = \frac{-\sqrt{3}}{2}$.

(a) [2] (UnitCircleWks #3) Find the value(s) of $\sin\theta$.

X values = $-\sqrt{3}/2$

want the y-values

b/c on unit circle

(.5) $x^2+y^2=1 \Rightarrow \left(\frac{-\sqrt{3}}{2}\right)^2 + y^2 = 1$

alg (+.5) $\Rightarrow y^2 = 1 - 3/4 = 1/4$

$y = \pm\frac{1}{2}$ each answer (+1)

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

$\sin^2\theta + \left(\frac{-\sqrt{3}}{2}\right)^2 = 1$

$\sin^2\theta = 1 - 3/4$

$\sin^2\theta = 1/4$

$\sin\theta = \pm 1/2$

If $\cos\theta = \frac{-\sqrt{3}}{2}$.

or θ could be determined with

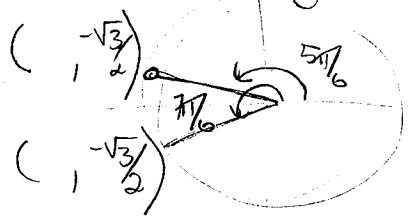
$5\pi/6$ or $\pi/6$ (+.5)

$\sin 5\pi/6 = \frac{1}{2}$ (+.5)

$\sin \pi/6 = -\frac{1}{2}$ (+.5)

(b) [2] Find all the value(s) of θ.

looking at the unit circle



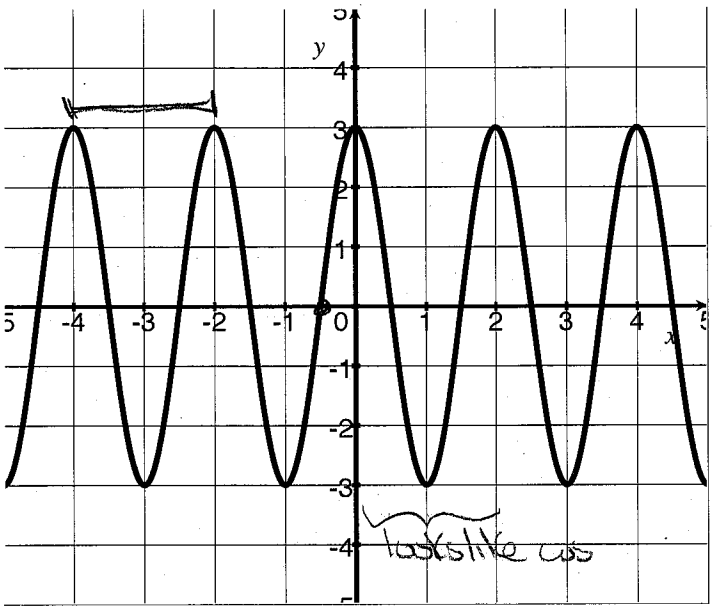
so (+1) $5\pi/6$ (+.5) + coterminal angles $\left(-\frac{7\pi}{6}, \frac{5\pi}{6}, \frac{17\pi}{6}, \ldots\right)$

150°

(+.5) $7\pi/6$ + coterminal angles $\left(-\frac{5\pi}{6}, \frac{7\pi}{6}, \frac{19\pi}{6}, \ldots\right)$

210°

3. (WebHW12 #11) Consider the graph of $f(x)$ shown below and to the right.



(a) [1] Find the period.

2 peak to peak

(b) [2] Find a the equation for f.

$\frac{2\pi}{k} = 2$ } (+.5)

$\Rightarrow \frac{2\pi}{2} = \frac{2k}{2}$

$\Rightarrow \pi = k$

$3\cos(\pi x)$

3 (+.5) cos (+.5) π x (+.5)

— or —

looks like sin shifted left 1/2

$3\sin(\pi(x+\frac{1}{2}))$

— or —

looks like cos shifted right 2 units

$3\cos(\pi(x-2))$

and we could just keep going...