Math 49B (8:30am – 9:20am)
Quiz 1
Fri Sep 26, 2008

SCORE: 15½ / 20 POINTS

What day of the month is your birthday ? 0 1
What are the last 2 digits of your address ? 2 5
What are the last 2 digits of your zip code ? 3 5
What are the last 2 digits of your social security number ? 1 4
[IF YOU DO NOT HAVE A SOCIAL SECURITY NUMBER, USE YOUR STUDENT ID NUMBER]

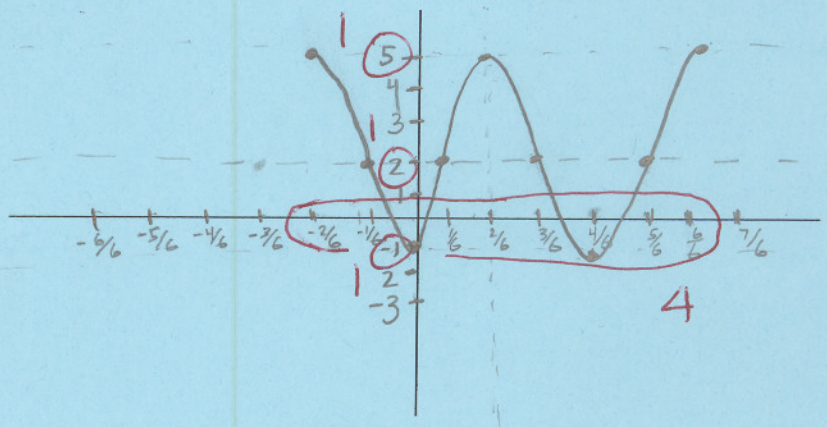
Sketch two full periods of the graph of $y = -3\cos(3\pi x - \pi) + 2$.
Label the 3 y-coordinates and 9 x-coordinates discussed in class.

SCORE: 10 / 11 POINTS

amplitude: $|-3| = 3$
midline: $+2$
period: $\frac{2\pi}{3\pi} = \frac{2}{3}$
phase shift: $3\pi x - \pi = 0 \Rightarrow 3\pi x = \pi \Rightarrow x = \frac{\pi}{3\pi} = \frac{1}{3}$ 1
direction: ∩

¼ period: $\frac{1}{4}\left(\frac{2}{3}\right) = \frac{2}{12} = \frac{1}{6}$

$\frac{2}{6} + \frac{1}{6} = \frac{3}{6}$
$\frac{3}{6} + \frac{1}{6} = \frac{4}{6}$
$\frac{4}{6} + \frac{1}{6} = \frac{5}{6}$
$= \frac{6}{6}$



1
4
SHAPE 2

A Ferris Wheel is built such that the height h (in yards) above ground of a seat on the wheel at time t (in seconds) can be modeled by

$$h(t) = 18 + 17\cos\left(\frac{t}{4} - \frac{3}{2}\right).$$

SCORE: 4 / 5 POINTS

[a] What is the period of the model ? What does the period tell you about the ride ? **(Give the correct units.)**

1½ ½

$\frac{2\pi}{1/4} = \frac{4(2\pi)}{1} = 8\pi$ seconds, the period tells us how long it takes for the ferris wheel takes to do one revolution 1

[b] What is the amplitude of the model ? What does the amplitude of the model tell you about the ride ? **(Give the correct units.)**

$|17| = 17$ yards, the amplitude tells us how high the ferris wheel goes.
½ ½

Throughout the day, the depth of water at the end of a dock in Bar Harbor, Maine varies with the tides. The table shows the depths (in meters) at various times during the morning. Branca wants to find a trigonometric function to model the data.

SCORE: 1½ / 4 POINTS

Time, t	Midnight	2 am	4 am	6 am	8 am	10 am	Noon
Depth, y	0.92	2.60	3.33	2.41	0.97	0.09	0.88

[a] What is the amplitude of Branca's function ? **(Give the correct units.)** Show the calculation(s) you used to find the answer.

$|3.3| = 3.3$ meters ½

[b] What is the period of Branca's function ? **(Give the correct units.)** Show the calculation(s) you used to find the answer.

lowest points are at 10 o'clock during the day,
∴ graph is a negative cosine function and the period between 10 pm → 10 am is ½ 12 hours ½