Math 49B
Group Quiz 1
Tue Jan 15, 2008

Names: _____
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THIS IS A NO CALCULATOR QUIZ

[3 POINTS] A ferris wheel is built such that the height h (in feet) above ground of a seat on the wheel at time t (in seconds) can be modeled by

$$h(t) = 42 + 38\sin\left(\frac{\pi}{12}t - \frac{\pi}{2}\right)$$

(a) Find the period of the model.

$$\frac{2\pi}{\frac{\pi}{12}} = \boxed{24} \quad \frac{1}{2}$$

(b) What does the period in part (a) tell you about the ride?

IT TAKES 24 (SECONDS) $\frac{1}{2}$ FOR THE WHEEL TO GO $\frac{1}{2}$ (AROUND) ONCE

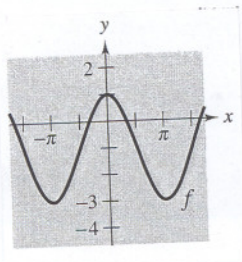(c) Find the amplitude of the model.

$\boxed{38} \quad \frac{1}{2}$

(d) What does the amplitude in part (c) tell you about the ride?

THE (RADIUS) OF THE WHEEL $\frac{1}{2}$ IS 38 (FEET) $\frac{1}{2}$

[2 POINTS] Find a and d for the function $f(x) = a\cos x + d$ such that the graph of f matches the figure below.

$$\text{MIDDLE} = \frac{1 + -3}{2} = \boxed{-1 = d} \quad '$$

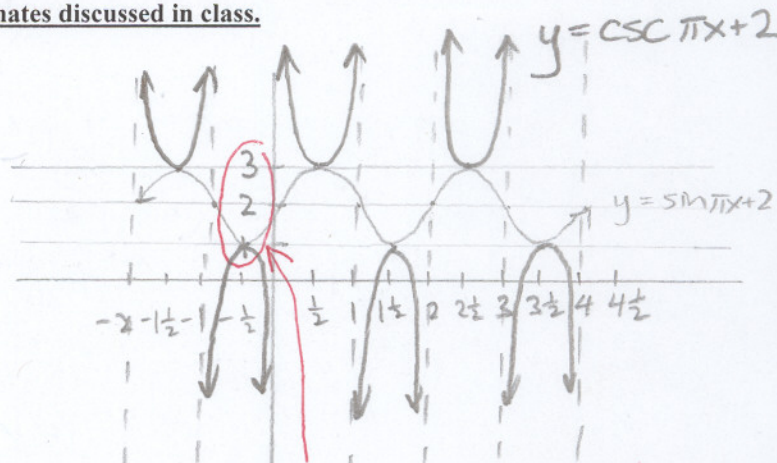$$\text{AMPLITUDE} = \frac{1 - (-3)}{2} = 2 = |a|$$

$\boxed{a = 2}$ ' SINCE GRAPH IS RIGHT SIDE UP

[5 POINTS] Sketch the graph of the function $f(x) = \csc \pi x + 2$.
Include two full periods, and label all x- and y-coordinates discussed in class.

$y = \sin \pi x + 2$

MIDDLE $y = 2$

AMPLITUDE 1 $\sim$

PERIOD $= \frac{2\pi}{\pi} = 2$

STARTS AT $x = 0$

$y = \csc \pi x + 2$

$y = \sin \pi x + 2$

I POINT EACH {
CORRECT MAXIMUM/MINIMUM/MIDDLE
CORRECT POSITION   X-COORDINATES
CORRECT SHAPE
4 LABELLED ASYMPTOTES
4 LABELLED MAXIMUM/MINIMUM
}