

SCORE: ___ / 20 POINTS

What day of the month is your birthday? _____

What are the last 2 digits of your address? _____

What are the last 2 digits of your zip code? _____

What are the last 2 digits of your social security number? _____

[IF YOU DO NOT HAVE A SOCIAL SECURITY NUMBER,
USE YOUR STUDENT ID NUMBER]Sketch two full periods of the graph of $y = -3\cos(4\pi x + \pi) + 1$.

Label the 3 y-coordinates and 9 x-coordinates discussed in class.

SCORE: ___ / 11 POINTS

$$\text{PERIOD} = \frac{2\pi}{4\pi} = \frac{1}{2} \quad \frac{1}{4} \text{ PERIOD} = \frac{1}{8}$$

$$\text{AMPLITUDE} = |-3| = 3$$

$$\text{MIDLINE} = 1$$

$$\text{START} = -\frac{\pi}{4\pi} = -\frac{1}{4}$$

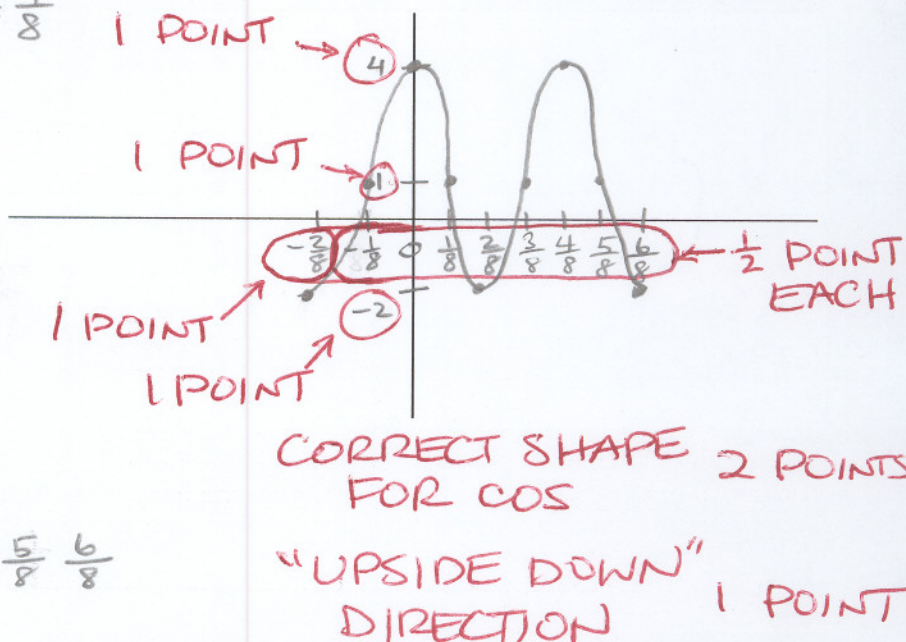
DIRECTION 

$$-\frac{1}{4} + \frac{1}{8} = -\frac{2}{8} + \frac{1}{8} = -\frac{1}{8}$$

$$-\frac{1}{8} + \frac{1}{8} = \frac{0}{8}$$

$$\frac{0}{8} + \frac{1}{8} = \frac{1}{8}$$

$$\frac{2}{8} \quad \frac{3}{8} \quad \frac{4}{8} \quad \frac{5}{8} \quad \frac{6}{8}$$



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 yards) at various times during the morning. Branca wants to find a trigonometric function to model the data.

SCORE: ___ / 4 POINTS

Time, t	Midnight	2 am	4 am	6 am	8 am	10 am	Noon
Depth, y	1.01	2.80	3.70	2.77	1.03	0.12	0.98

- [a] What is the period of Branca's function? (Give the correct units.) Show the calculation(s) you used to find the answer. 1 POINT
- MAXIMUM AT $t=4$
MINIMUM AT $t=10$
- $\frac{1}{2}$ PERIOD $t=10$
- PERIOD = $2(10-4) = 2(6)$
PERIOD = 12 HOURS
- [b] What is the amplitude of Branca's function? (Give the correct units.) Show the calculation(s) you used to find the answer. 1/2 POINT EACH
- MAXIMUM $y=3.70$
MINIMUM $y=0.12$
- AMPLITUDE = $\frac{1}{2}(3.70-0.12)$
= $\frac{1}{2}(3.58) = 1.79$ YARDS

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

$$h(t) = 17 + 16\cos\left(\frac{t}{3} - \frac{3}{2}\right)$$

SCORE: ___ / 5 POINTS

- [a] What is the amplitude of the model? What does the amplitude of the model tell you about the ride? (Give the correct units.) 1 POINT

16 METERS = RADIUS OF WHEEL

- [b] What is the period of the model? What does the period tell you about the ride? (Give the correct units.) 1 POINT

$\frac{2\pi}{\frac{1}{3}} = 6\pi$ SECONDS = TIME FOR WHEEL TO GO AROUND ONCE (TIME FOR 1 REVOLUTION)

1 1/2 POINTS 1/2 POINT