

Graphing Trig Functions

Name _____
Period _____ Date _____

Instructions: Complete the following worksheet. Do your graphs on graph paper. Carefully label your axes. The "incremental points" should be readily apparent from the graphs. Your graphs will be graded on neatness, accuracy and completeness.

A. The tides in the Bay of Fundy between New Brunswick and Nova Scotia are among the largest in the world. Assume the depth (d) of the water channel changes over time and is modeled by the function:

$$d = 29 \sin\left(\frac{\pi}{6}t\right) + 32 \text{ where } t \text{ is the number of hours after midnight (e.g., } t=14 \text{ corresponds to 2pm)}$$

1. Analyze the function by completing the following:

Sinusoidal axis: _____

Amplitude: _____

Range: _____

Period: _____

Increment: _____

Phase shift: _____

2. Graph (*by hand*) the function over two complete cycles.

3. Answer the following questions about the graph of the function:

a. At what times does high tide occur _____

b. What is the depth at high tide _____

c. At what times does low tide occur _____

d. What is the depth at low tide _____

e. A fishing captain wishes to unload his catch at a pier on the channel.

His boat requires a depth of at least 10 feet of water.

Use your graph to estimate during what hours of the

day he is unable to reach the pier _____.

B. Blood pressure is the force per unit area (in millimeters of mercury) against the walls of blood vessels. As the heart muscle contracts, the pressure rises and falls. Assume an individual's blood pressure can be modeled by the function:

$$P = 90 - 20 \cos \frac{5\pi}{2} t \quad \text{where } t \text{ is the time (in seconds).}$$

1. Analyze the function by completing the following:

Sinusoidal axis: _____

Amplitude: _____

Range: _____

Period: _____

Increment: _____

Phase shift: _____

2. Graph (*by hand*) the function over three complete cycles.

3. Answer the following questions about the graph of the function:

a. What is the maximum pressure for this individual _____

b. What is the minimum pressure for this individual _____

c. How long does it take to complete one cycle _____

d. If each cycle of the graph corresponds to one heart beat, what is the individual's pulse rate (i.e., heart beats per minute) _____.