**REVIEW OF MODULE 3 NAME:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

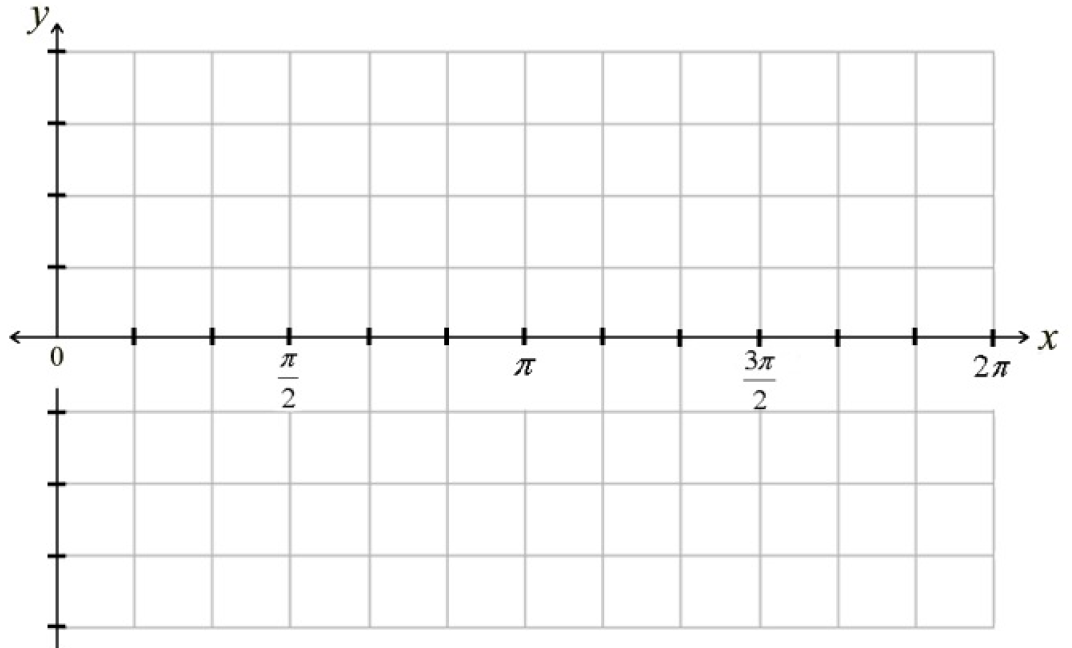
**EXTENDED RESPONSE**

1. A thumbtack is stuck to a bicycle tire. If the tire has a radius of 22 cm, sketch the height of the thumbtack above the ground as the tire rotates counterclockwise through 4 turns. Start your graph when the thumbtack is at the 3 o’clock position. Provide appropriate labels on the graph.

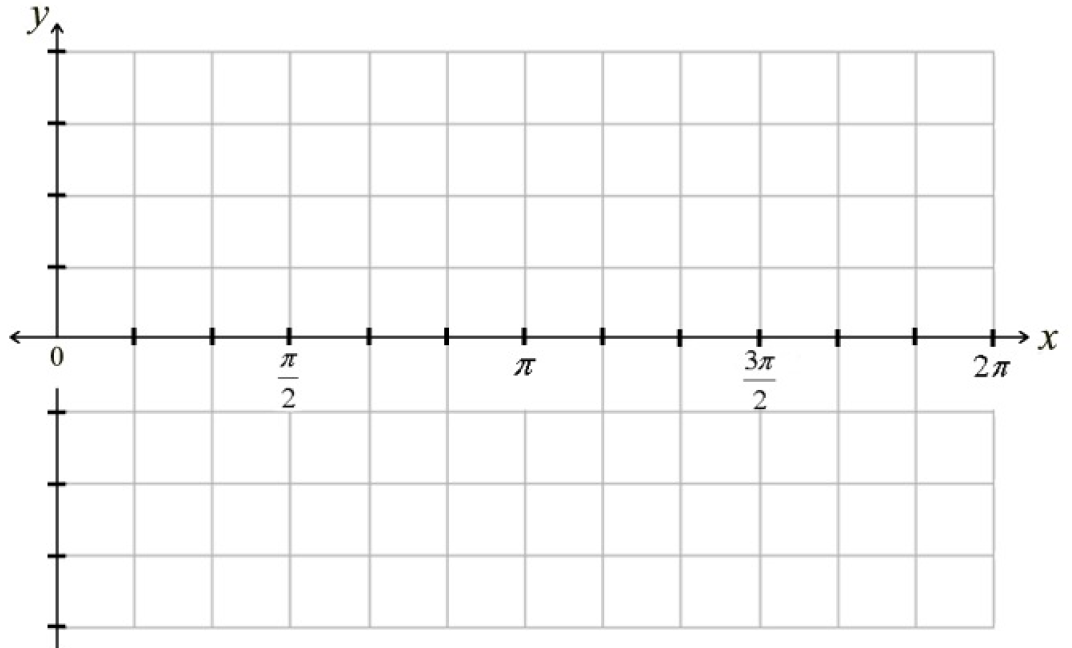
Write the equation for the graph.

1. If a Ferris wheel with a diameter of 340 feet completes 3 turns and passengers board the Ferris wheel at the bottom (which is 4 feet above the ground), create a graph of a function that represents the height above the ground of the passenger car. Provide appropriate labels on the axes.
2. An oscilloscope is a machine that changes sound waves into electric impulses and shows their graph on a monitor. One such graph can be represented by the equation where represents time in seconds. What is the period of the function?
3. What is the maximum value of the function:
4. Using the domain of , graph the functions and on the same

set of axes below.



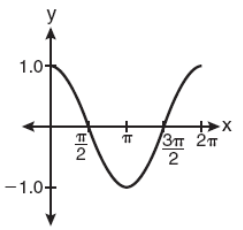
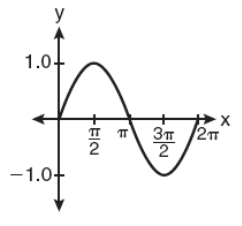
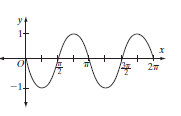
1. For what values of does ?
2. In what interval(s) are both and positive?
3. In what interval(s) are both and negative?
4. Graph on the set of axes below:



1. Complete the chart below based upon the graphs of and .

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| --- | --- |
| Similarities | Differences |
|  |  |

1. Write an equation for each of the functions shown below:

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1. Complete the chart below:

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1. Convert each of the degree measures below to radian measure.

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| --- | --- | --- | --- |
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1. Convert each of the radian measures below to degree measure.

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1. State the **amplitude**, **period**, **horizontal shift**, and **vertical shift** for each of the following:
2. b)
3. Suppose a windshield wiper arm has a length of 22 inches and rotates through an angle of .

What distance does the tip of the wiper travel, *to the nearest inch*, as it moves from one side of the windshield to the other.

1. Verify the Pythagorean identity:
2. Verify this identity:
3. Given that , and , find the value of
4. Write the equation of a graph satisfying all of the following conditions:

* Sine
* Period of
* Amplitude of 7
* Shifted 3 down

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1. Graph ONE cycle of:
2. Graph ONE cycle of: )
3. Graph ONE cycle of: