1. What is the difference between a sinusoidal function and a polynomial function?
2. If the equilibrium point is y=0, then models a buoy bobbing up and down in the water.
   1. Describe the location of the buoy when t = 0
   2. What is the maximum height of the buoy?
   3. Find the location of the buoy at t = 7
3. Every time your heart beats your blood pressure oscillates between 140 and 180. If the heart beats once every second, write a sine function that models the person’s blood pressure.
4. The average monthly temperatures of the city in Seattle, Washington, are given below.

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. |
| 41 | 44 | 47 | 50 | 56 | 61 | 65 | 66 | 61 | 54 | 46 | 42 |

* 1. Find the amplitude of a sinusoidal function that models the monthly temperature.
  2. Find the vertical shift of a sinusoidal function that models the monthly temperature?
  3. Write a sinusoidal function that models the monthly temperatures, using t= 1 to represent January. (This means it has been shifted 1)
  4. According to your model, what is the average monthly temperature in February? How does this compare to the actual average?

1. A rodeo performer spins a lasso in a circle perpendicular to the ground. The height of the knot from the ground is modeled by , where t is the time measured in seconds.
   1. What is the highest point reached by the knot?
   2. What is the lowest point reached by the knot?
   3. What is the period of the model?
   4. According to the model, find the height of the knot after 25 seconds.
2. A leaf floats on the water bobbing up and down. The distance between its highest and lowest point is 4 centimeters. It moves from its highest point down to its lowest point and back to its highest point every 10 seconds. Write a cosine function that models the movement of the leaf in relationship to the equilibrium point.
3. In Daytona Beach, Florida, the first high tide was 3.99 feet at 12:03 a.m. The first low tide of .55 feet occurred at 6:24 a.m. The second high tide occurred at 12:19 p.m.
   1. Find the amplitude of a sinusoidal function that models the tides.
   2. Find the vertical shift of the sinusoidal function that models the tides
   3. What is the period of the sinusoidal function that models the tides?
   4. Write a sinusoidal function to model the tides using t to represent the number of hours in decimals since midnight.
   5. According to your model, determine the height of the water at noon.
4. For an alternating current, the instantaneous voltage Vr is a sinusoidal function of time. Vr will drop from a high of 120 and a low of -120 every thirty seconds. Write a sinusoidal function for

Voltage, Vr. over time.