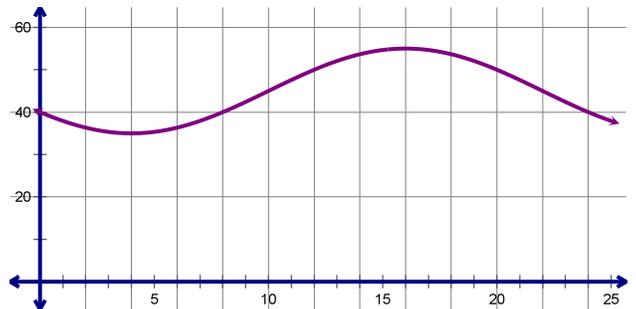


Algebra 2  
Sinusoidal Modeling

Name: \_\_\_\_\_  
Period: \_\_\_\_\_

1. A weather station in Sammamish measured a low temperature at 4am on a certain day. The high temperature for the day was recorded at 4pm. The temperature during the day can be approximated by the sinusoidal function graphed below where  $x$  is the number of hours after midnight and  $y$  is degrees Farenheit.

- Using the graph, determine the low temperature at 4am and the high at 4pm.
- At what time does the temperature first reach  $45^\circ$  F?
- What is the period for the function graphed?
- Write a sine equation for the function graphed.



2. Aaron rode his bike over a piece of gum and continued riding at a constant rate. The height (in centimeters) of the gum on his tire at any time,  $x$  (in seconds), can be modeled by the equation  $f(x) = 15 \cos\left(\frac{\pi}{2}(x - 2)\right) + 15$

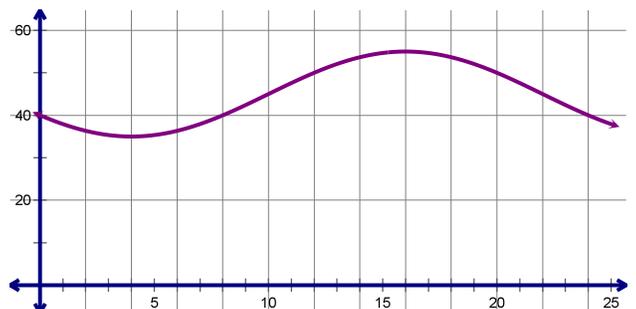
- Graph the equation.
- What is the maximum height of the gum?
- After how many seconds does the gum reach its maximum height for the first time?
- How many seconds does it take for the gum to make a complete rotation on the tire?
- How many seconds will it take for the gum to be at its maximum height for the third time?

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