

4. [7 points] After the success of his new bacon-flavored soda, Louis wants to try making a flavor that customers will find more refreshing in the hot summer months. Louis notices daily sales of his new spearmint soda vary seasonally. Sales reach a high of \$300 around August 1 and a low of \$120 around February 1. Suppose that daily sales of the soda (in dollars) can be modeled by a sinusoidal function  $S(t)$  where  $t$  is the time in months since January 1. Note that August 1 is seven months after January 1. You do not need to show work for this problem.
- a. [2 points] What are the period and amplitude of the function  $S(t)$ ?

Period = \_\_\_\_\_

Amplitude = \_\_\_\_\_

- b. [5 points] Write a formula for the function  $S(t)$ .

$S(t) =$  \_\_\_\_\_

5. [6 points] For which value(s) of  $a$  is the following function continuous? Show all of your work.

$$f(x) = \begin{cases} \frac{x^2 - 9}{x - 3} & \text{for } x < 3 \\ ax^2 + 2x + 15 & \text{for } x \geq 3 \end{cases}$$