

8. [9 points]

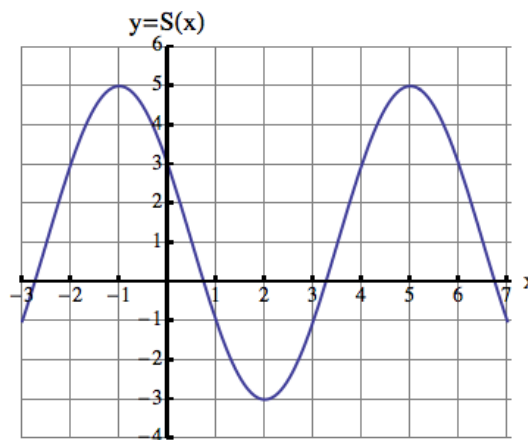
- a. [4 points] A population of butterflies in a botanical garden has been found to oscillate sinusoidally. The population of butterflies reaches a maximum of 2000 butterflies followed by a minimum of 750 butterflies two months later. Let  $B(t)$  be the amount of butterflies in the botanical garden at time  $t$  (in months). Find the amplitude, midline and period of the periodic function  $y = B(t)$ .

Amplitude: \_\_\_\_\_.

Period: \_\_\_\_\_.

Midline: \_\_\_\_\_.

- b. [5 points] The graph of a sinusoidal function  $y = S(x)$  is shown below. Find a formula for  $S(x)$ .

 $S(x) =$  \_\_\_\_\_