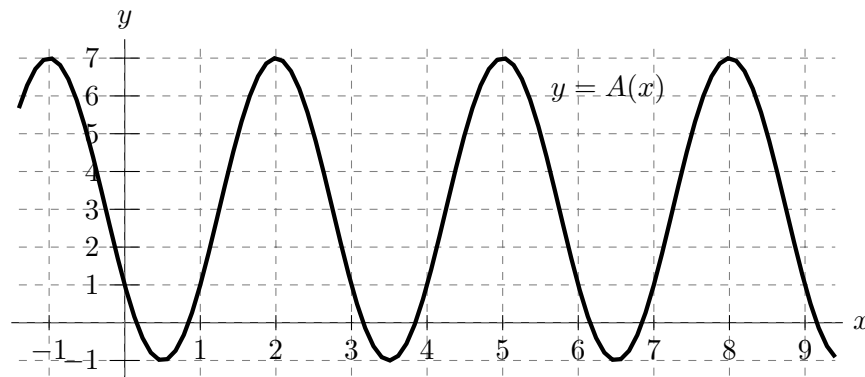


8. [4 points] Let  $A(x)$  be a sinusoidal function, a portion of which is shown in the graph below.



Write a formula for  $A(x)$ .

**Answer:**  $A(x) =$  \_\_\_\_\_

9. [7 points] Consider the function  $f(x)$  defined by

$$f(x) = \begin{cases} xe^{Ax} + B & \text{if } x < 3 \\ C(x-3)^2 & \text{if } 3 \leq x \leq 5 \\ \frac{130}{x} & \text{if } x > 5. \end{cases}$$

Suppose  $f(x)$  satisfies all of the following:

- $f(x)$  is continuous at  $x = 3$ .
- $\lim_{x \rightarrow 5^+} f(x) = 2 + \lim_{x \rightarrow 5^-} f(x)$ .
- $\lim_{x \rightarrow -\infty} f(x) = -4$ .

Find the values of  $A$ ,  $B$ , and  $C$ .

Show your work. You must give exact answers. Do not use decimal approximations. For example, 0.333333333 would not be an acceptable answer if the answer were  $\frac{1}{3}$ .

**Answer:**  $A =$  \_\_\_\_\_,  $B =$  \_\_\_\_\_, and  $C =$  \_\_\_\_\_