1. [10 points] The function $A(x)$ has domain $(-\infty, \infty)$, is **odd**, and is periodic with period 8. Some values of $A(x)$ are given in the table below as well as a formula for the function $B(x)$.

x	-4	-2	1	3
$A(x)$	0	3	1	-2

$$B(x) = 7\log(x^2) - 4$$

a. [6 points] Find each of the following values. *Give your answers in exact form or rounded to 3 decimal places. Or, if there is not enough information to find a value, write* NEI, *or if the value does not exist, write* DNE.

i. $A(0) =$ 0

ii. $A(2) =$ -3

iii. $A(6) =$ 3

iv. $A(25) =$ 1

v. $B(A(3)) =$ $7\log(4) - 4 \approx 0.214$

vi. $A(B(1)) =$ 0

Suppose that $C(x)$ is a different periodic function with amplitude 7 and a maximum of 11. The period of $C(x)$ is also 8.

b. [2 points] Find each of the following, or if there is not enough information, write NEI.

i. the midline of $C(x)$: $y =$ 4

ii. the minimum of $C(x)$: -3

c. [2 points] Must the function $A(x) + C(x)$ also be periodic? Circle your answer, and then briefly explain.

YES NO

Explanation:

Solution: Since $A(x + 8) = A(x)$ and $C(x + 8) = C(x)$ for any input x, the sum $A(x + 8) + C(x + 8) = A(x) + C(x)$ is also periodic. That is, since the values of $A(x)$ repeat after 8 units, and the same for $C(x)$, the sums of these values also repeat after 8 units.