1. [11 points] The following table gives values of functions $A(t)$, $B(t)$, $B^{-1}(t)$, and $A(B(t))$ at various values of t. Assume $B(t)$ is invertible.

t	-2	0	2	3	5
$A(t)$	0	3	-2	0	2
$B(t)$	**2**	3	0	-2	5
$B^{-1}(t)$	**3**	2	-2	0	5
$A(B(t))$	-2	**0**	3	0	2

a. [3 points] Could $A(t)$ be invertible? Circle your answer and give a **brief explanation**.

YES NO

Solution: The t-values -2 and 3 both have outputs of zero, so $A(t)$ will fail the horizontal line test.

b. [3 points] Write the correct values in the three blank spaces in the table.

Solution: $B^{-1}(2) = -2$, so $B(-2) = 2$.
$B(3) = -2$, so $B^{-1}(-2) = 3$.
$A(B(0)) = A(3) = 0$.

c. [2 points] Calculate:

- $A(B^{-1}(0)) = A(2) = -2$
- $B(A(5)) = B(2) = 0$

d. [3 points] Find all solutions to the following equation that can be determined using only the information given in the table:

$$B(A(t)) = 3.$$

Solution: The input of B that outputs 3 is 0, so we set

$$A(t) = 0.$$

The table shows two inputs of A that output zero, $t = -2, 3$.

