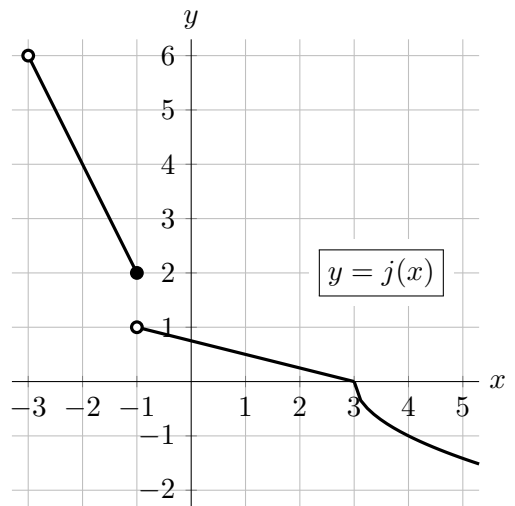


1. [10 points]

A portion of the graph of the function  $j(x)$ , whose domain is  $(-3, \infty)$ , is shown to the right. Note that:

- $j(x)$  is linear on  $(-3, -1]$  and on  $(-1, 3]$ .
- On the interval  $[3, \infty)$ , the function  $j(x)$  is given by the formula  $-\sqrt{x-3}$ .

For parts **a.–c.**, find the **exact** values, or write NEI if there is not enough information to do so, or write DNE if the value does not exist. Your answers should not include the letter  $j$  but you do not need to simplify. Show work.



a. [2 points] Find  $j'(4)$ .

**Answer:**  $j'(4) =$  \_\_\_\_\_

b. [3 points] Let  $A(x) = \frac{x}{j(x)}$ . Find  $A'(1)$ .

**Answer:**  $A'(1) =$  \_\_\_\_\_

c. [3 points] Let  $B(x) = 2^{j(x)}$ . Find  $B'(-2)$ .

**Answer:**  $B'(-2) =$  \_\_\_\_\_

d. [2 points] On which of the following intervals does  $j(x)$  satisfy the hypotheses of the Mean Value Theorem? Circle all correct answers. You do not need to show work for this part.

$[-1, 2]$

$[0, 5]$

$[3, 5]$

NONE OF THESE