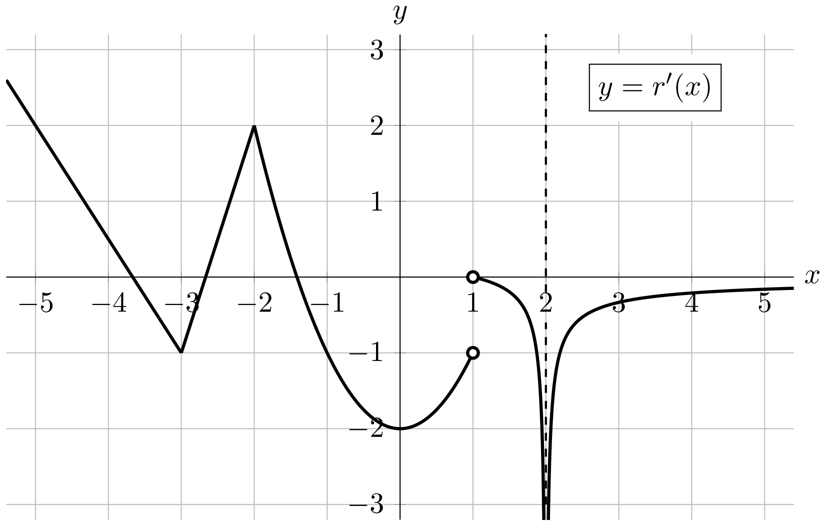
7. [10 points] Given below is a portion of the graph of $r'(x)$, the derivative of the continuous function $r(x)$, along with a table of some values of $r(x)$. Note that $r'(x)$ has a vertical asymptote at $x = 2$. Use the graph and the table to answer the questions below. *You do not need to show work.*



x	-3	-2	1	2
$r(x)$	6.5	7	4	??

a. [1 point] Circle all of the x values below at which the function $r'(x)$ is not continuous.

$x = -2$ $\qquad$ $x = 0$ $\qquad$ $\boxed{x = 1}$ $\qquad$ $\boxed{x = 2}$ $\qquad$ NONE OF THESE

b. [6 points] Find the **exact** numerical value of each expression below, if possible. For any values that do not exist, including if they are limits that diverge to $\pm\infty$, write DNE.

i. $\lim_{x \to 0} r'(x) =$ -2

ii. $\lim_{x \to 1^-} r'(x) =$ -1

iii. $\lim_{x \to 2^+} \frac{1}{r'(x)} =$ 0

iv. $\lim_{x \to -1} r'(2x + 3) =$ **DNE**

v. $\lim_{h \to 0} \frac{r'(-4+h) - r'(-4)}{h} =$ $-3/2$

vi. $\lim_{t \to 0} \frac{r(-2+t) - 7}{t} =$ 2

c. [1 point] Given that $r(2)$ is one of the five values below, determine which one it is by circling the one correct answer.

$\boxed{\frac{10}{3}}$ $\qquad$ 4 $\qquad$ 5 $\qquad$ $\frac{16}{3}$ $\qquad$ $4 + 2^{1/3}$

d. [2 points] Find an equation of the line tangent to the graph of $r(x)$ at $x = -3$.

Solution:

$$y = r(-3) + r'(-3)(x+3) = 6.5 + (-1)(x+3) = 3.5 - x.$$

Answer: $y =$ $6.5 - (x+3)$, **or** $y = 3.5 - x$