

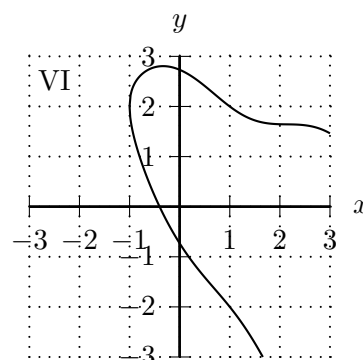
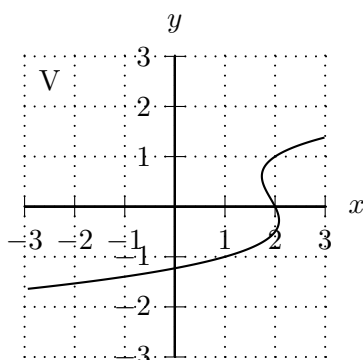
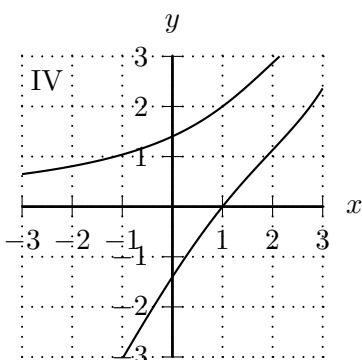
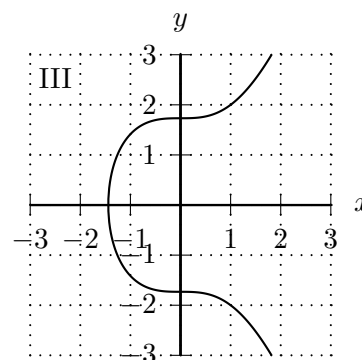
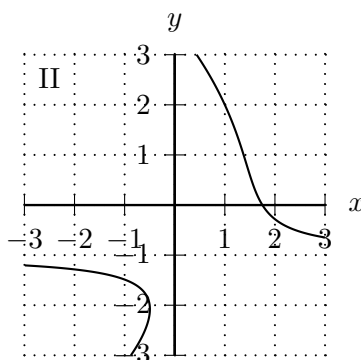
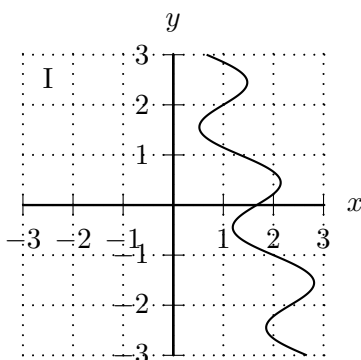
11. [5 points] A curve \mathcal{C} gives y as an implicit function of x . The curve \mathcal{C} passes through the point $(1, 2)$ and satisfies

$$\frac{dy}{dx} = \frac{y^2 - 2xy + 4y - 5}{4(y - x)}.$$

- a. [1 point] One of the values below is the slope of the curve \mathcal{C} at the point $(1, 2)$. Circle that one value.

Answer: The slope at $(1, 2)$ is $\frac{1}{4}$ $\frac{1}{3}$ $\frac{1}{2}$ $\frac{5}{8}$ $\frac{2}{3}$ $\frac{3}{4}$ $\frac{4}{5}$

- b. [4 points] One of the following graphs is the graph of the curve \mathcal{C} . Which of the graphs I-VI is it? To receive any credit on this question, you must circle your answer next to the word “Answer” below.

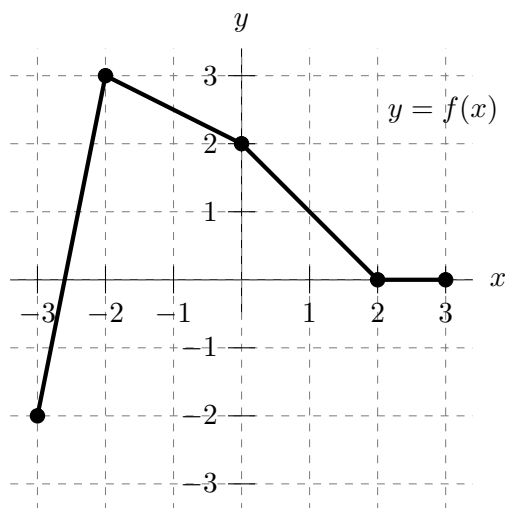


Remember: To receive any credit on this question, you must circle your answer next to the word “Answer” below.

Answer: I II III IV V VI

2. [12 points]

Let f be the piecewise linear function with graph shown below.



The table below gives several values of a differentiable function g and its derivative g' .

Assume that both $g(x)$ and $g'(x)$ are invertible.

x	-2	-1	0	2	5
$g(x)$	21	11	5	-1	-3
$g'(x)$	-12	-8	-4	-2	-0.4

You are not required to show your work on this problem. However, limited partial credit may be awarded based on work shown.

For each of parts **a.-f.** below, find the value of the given quantity. If there is not enough information provided to find the value, write “NOT ENOUGH INFO”. If the value does not exist, write “DOES NOT EXIST”.

a. [2 points] Let $j(x) = e^{g(x)}$. Find $j'(2)$.

Answer: _____

b. [2 points] Let $k(x) = f(x)f(x + 2)$. Find $k'(-1)$.

Answer: _____

c. [2 points] Let $h(x) = 3f(x) + g(x)$. Find $h'(-2)$.

Answer: _____

d. [2 points] Find $(g^{-1})'(2)$.

Answer: _____

e. [2 points] Let $m(x) = g(f(g(x)))$. Find $m'(2)$.

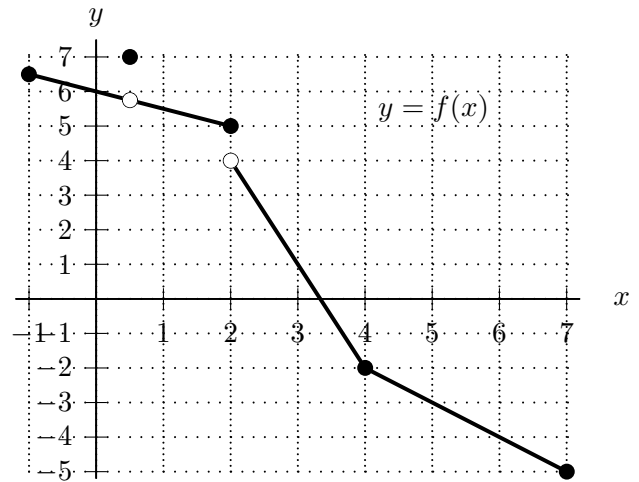
Answer: _____

f. [2 points] Let $\ell(x) = \frac{f(x)}{g(2x)}$. Find $\ell'(-1)$.

Answer: _____

2. [11 points]

Shown to the right is the graph of a function $f(x)$.



Note that you are not required to show your work on this problem. However, limited partial credit may be awarded based on work shown.

Find each of the following values. If the value does not exist, write DOES NOT EXIST.

a. [3 points] Let $h(x) = f(3x + 1)$. Find $h'(1)$.

Answer: $h'(1) =$ _____

b. [3 points] Let $k(x) = e^{f'(x)}$. Find $k'(6)$.

Answer: $k'(6) =$ _____

c. [2 points] Find $(f^{-1})'(0)$.

Answer: $(f^{-1})'(0) =$ _____

d. [3 points] Let $j(x) = \frac{f(2x + 1)}{x + 1}$. Find $j'(1)$.

Answer: $j'(1) =$ _____