

Name: \_\_\_\_\_

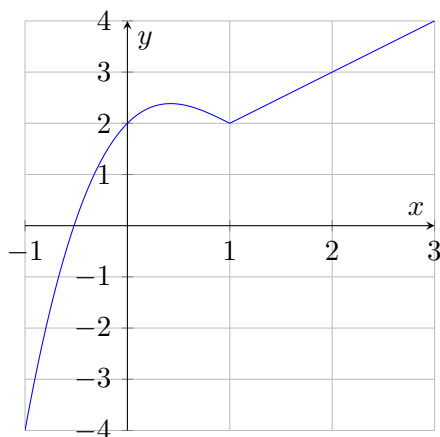
Mark: \_\_\_\_\_

**Mini-math Div 3/4: Friday, October 8, 2021 (15 minutes)**

1. (1 point) True or False: If a function is not differentiable at a point  $x = a$ , then  $a$  is not in the domain of  $f$ .

2. (1 point) True or False: If  $f$  and  $g$  are differentiable at  $x = a$ , so is  $\frac{f}{g}$ .

3. (2 points) Sketch the derivative of the following function on the same graph. Be sure to indicate, if any, approximate zeros, asymptotes, and general shape of the graph of the derivative.



4. (2 points) Compute

$$\lim_{x \rightarrow 1} \frac{10^x - 10}{x - 1}$$

5. (2 points) Differentiate:  $f(x) = \frac{x^2 + \sqrt{x} - \sin x}{x^2}$

6. (2 points) Differentiate:  $f(x) = 2^x \sec x$

7. (3 points) (AP) Consider differentiable functions  $f(x)$  and  $g(x)$  which have the following values and derivatives:

$x$	$-\frac{\pi}{6}$	$\frac{\pi}{6}$	$\frac{\pi}{4}$	$\frac{\pi}{3}$	$\frac{5\pi}{6}$
$f(x)$	1	2	-1	-2	4
$g(x)$	-2	1	-3	-1	2
$f'(x)$	3	-2	2	1	-1
$g'(x)$	2	-3	1	-2	3

Find  $h'(\pi/6)$  if  $h(x) = \frac{g(x) \sin x}{f(x)}$