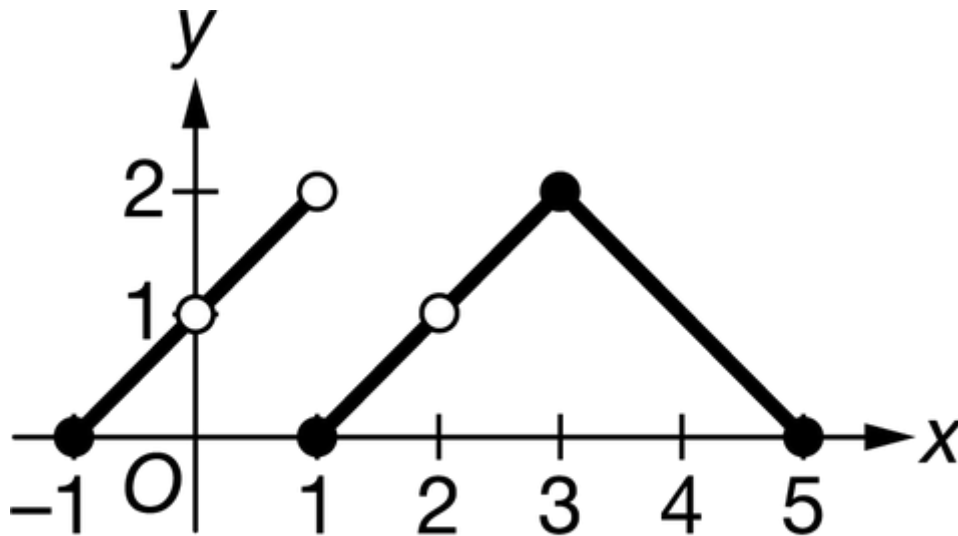


## Day 3 Wrap up Questions

Name \_\_\_\_\_

1.

Graph of  $f$ 

The graph of the function  $f$  is shown above. What are all values of  $x$  for which  $f$  has a removable discontinuity?

- (A) 0 only
- (B) 1 only
- (C) 0 and 2 only
- (D) 0, 1, and 2

2.

$$f(x) = \begin{cases} x^2 + 2x & \text{for } x < 1 \\ 3 & \text{for } x = 1 \\ x^3 + x^2 + x & \text{for } 1 < x < 3 \\ 0 & \text{for } x = 3 \\ 2x + 1 & \text{for } x > 3 \end{cases}$$

Let  $f$  be the piecewise function defined above. Which of the following statements is false?



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- (A)  $f$  is continuous at  $x = 1$ .
- (B)  $f$  is continuous at  $x = 2$ .
- (C)  $f$  is continuous at  $x = 3$ .
- (D)  $f$  is continuous at  $x = 4$ .
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3.

$x$	0	1	2	3	4	5
$f(x)$	1	-5	-4	2	-10	-15

Selected values of a continuous function  $f$  are given in the table above. What is the fewest possible number of zeros of  $f$  in the interval  $[0, 5]$ ?

- (A) Zero, because  $f(x)$  is not equal to 0 for any of the values in the table.
- (B) One, because  $f$  is continuous on the interval  $[0, 5]$  and  $f(0) > 0 > f(5)$ .
- (C) Two, because the values for  $f(x)$  in the table change from positive to negative twice.
- (D) Three, because  $f$  is continuous on the interval  $[0, 5]$  and  $f(0) > 0 > f(1)$ ,  $f(1) < 0 < f(3)$ , and  $f(3) > 0 > f(5)$ .
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4. 
$$f(x) = \begin{cases} \frac{\sin(5x)}{8x} & \text{for } x \neq 0 \\ c & \text{for } x = 0 \end{cases}$$

The function  $f$  is defined above, where  $c$  is a constant. For what value of  $c$  is  $f$  continuous at  $x = 0$ ?



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(A) 0

(B)  $\frac{5}{8}$

(C) 1

(D) 8

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5. Let  $f$  be the function given by  $f(x) = \frac{x-2}{2|x-2|}$ . Which of the following is true?

(A)  $\lim_{x \rightarrow 2} f(x) = \frac{1}{2}$

(B)  $f$  has a removable discontinuity at  $x = 2$ .

(C)  $f$  has a jump discontinuity at  $x = 2$ .

(D)  $f$  has a discontinuity due to a vertical asymptote at  $x = 2$ .

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6.  $f(x) = \begin{cases} a^2 + x^2 & \text{for } x < 3 \\ a(x + 3) & \text{for } x \geq 3 \end{cases}$

Let  $f$  be the function defined above, where  $a$  is a constant. For what values of  $a$ , if any, is  $f$  continuous at  $x = 3$ ?



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- (A) 0 only
- (B) 3 only
- (C) 0 and 3
- (D) There is no such  $a$ .
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