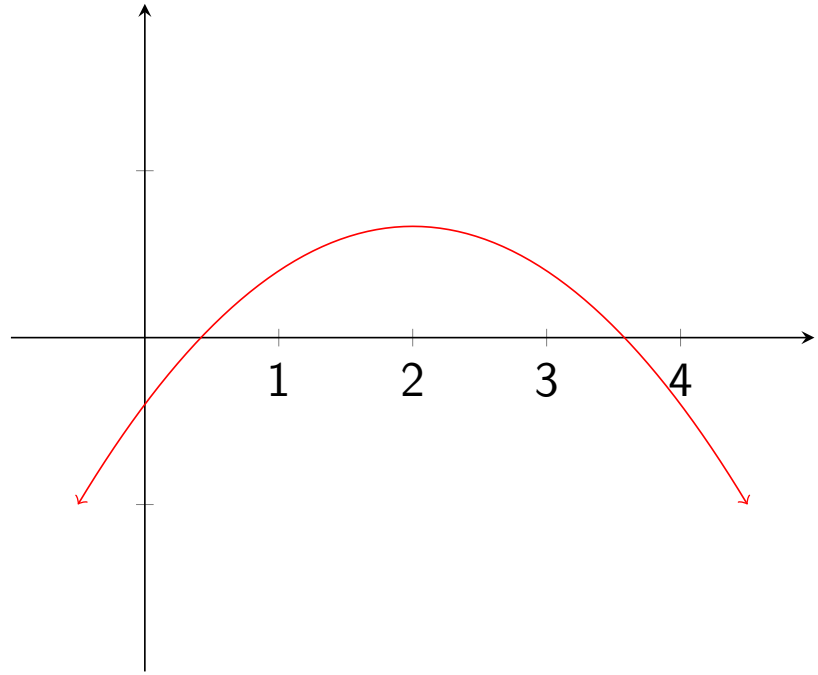
1. The graph of the function f is depicted to the right. For which value of a is $f'(a) = 0$?



(A) 0

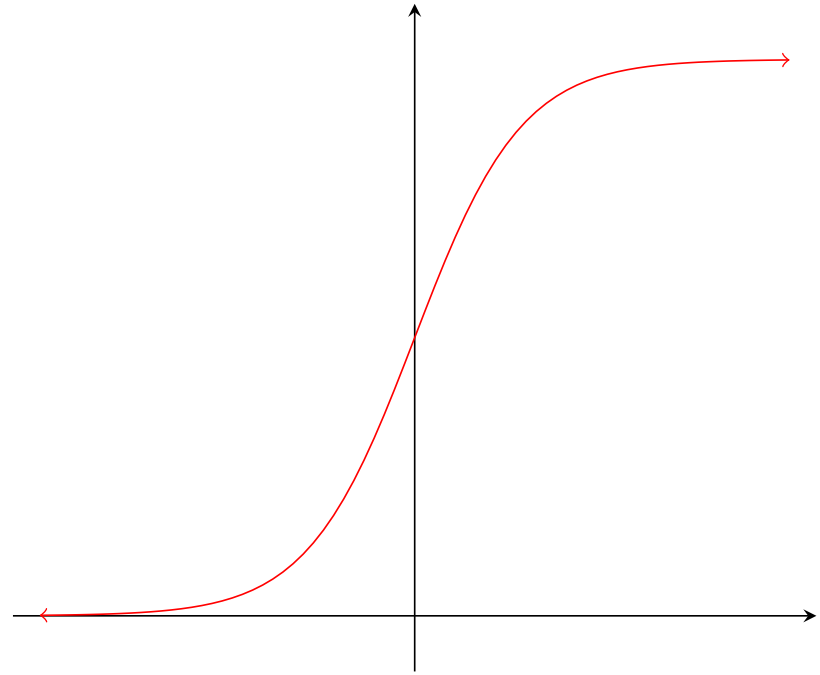
(B) 1

(C) 2

(D) None of the above.

2. The graph of the function f is depicted to the right.

What is $\lim_{a \to \infty} f'(a)$?



(A) -1

(B) 0

(C) 1

(D) None of the above.

3. True or False?

The line $y = 4x - 4$ is tangent to the graph of $f(x) = x^2$.

4. At how many points on the graph of $f(x) = x^2 + 3x - 7$ is the tangent line horizontal?

(A) None.

(B) 1.

(C) 2.

(D) 3 or more.

5. Let f be the function defined by

$$f(x) = x - \sqrt{x}.$$

Which of the following is the slope of the secant line passing through the two points $(a, f(a))$ and $(a+h, f(a+h))$ for $h \neq 0$?

(A) $1 - \dfrac{1}{\sqrt{a+h} + \sqrt{a}}$

(B) $1 + \dfrac{1}{\sqrt{a+h} + \sqrt{a}}$

(C) $1 - \dfrac{1}{\sqrt{a+h} - \sqrt{a}}$

(D) None of the above

6. Which of the following accurately describes the function f defined by the following formula?

$$f(x) = \begin{cases} x \sin(1/x) & \text{if } x \neq 0 \\ 0 & \text{if } x = 0 \end{cases}$$

(A) f is discontinuous at 0.

(B) f is continuous at 0, but is not differentiable at 0.

(C) f is differentiable at 0.

7. Which of the following accurately describes the function f defined by the following formula?

$$f(x) = \begin{cases} x^2 \sin(1/x) & \text{if } x \neq 0 \\ 0 & \text{if } x = 0 \end{cases}$$

(A) f is discontinuous at 0.

(B) f is continuous at 0, but is not differentiable at 0.

(C) f is differentiable at 0.

8. True or False?

Suppose f is a differentiable function satisfying $f'(x) = 3f(x)$ and $f(0) = 3$. Then f is an increasing function.