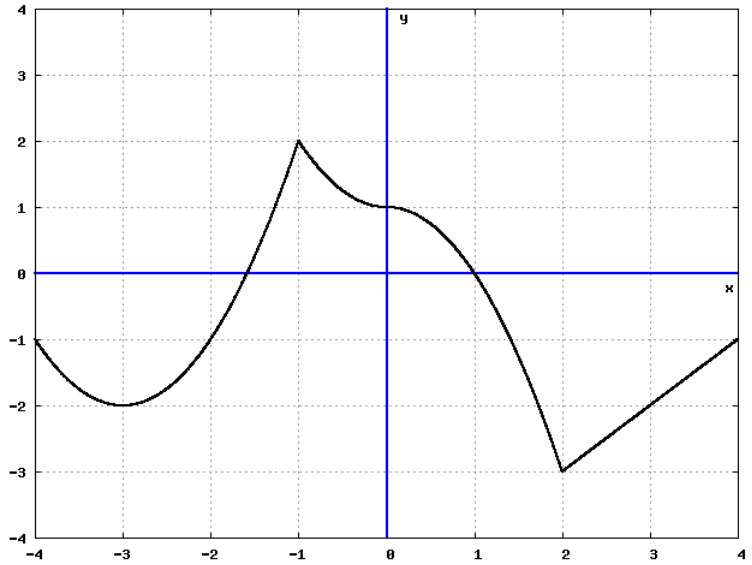
1. The graph of the function f is shown here. At how many points in the interval $(-4, 4)$ is the derivative of f not defined?



(a) 0

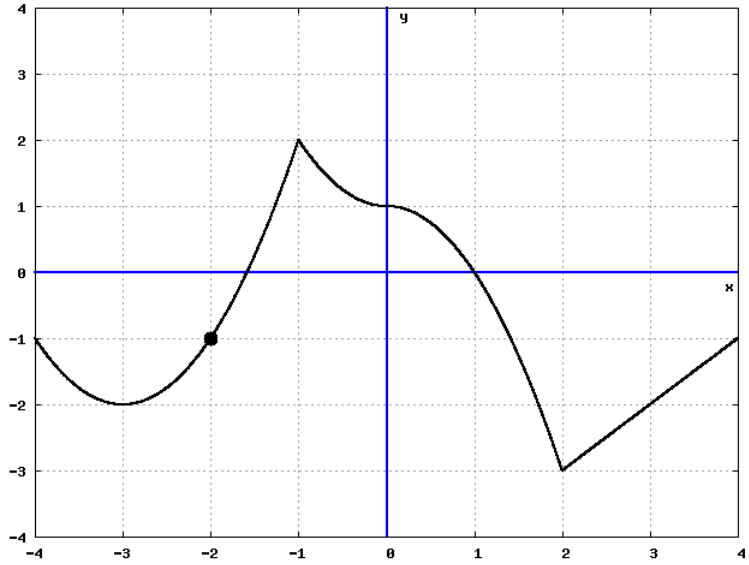
(b) 1

(c) 2

(d) 3

Solution

2. The graph of the function f is shown here. Which one of these is true of the derivative of f at the indicated point?



(a) It is positive.

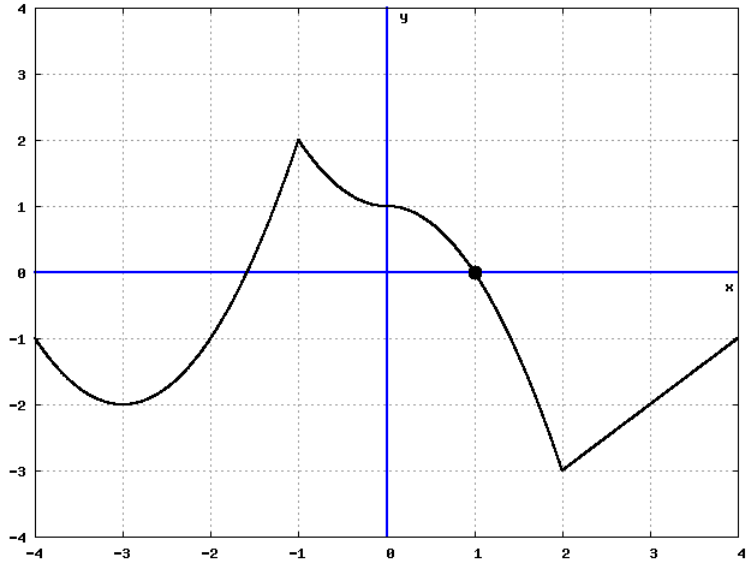
(b) It is negative.

(c) It is zero.

(d) It is not defined.

Solution

3. The graph of the function f is shown here. Which one of these is true of the derivative of f at the indicated point?



(a) It is positive.

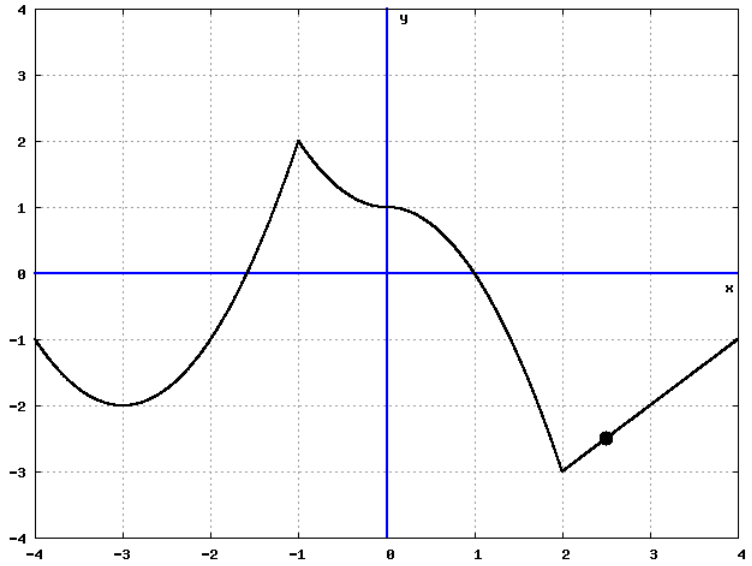
(b) It is negative.

(c) It is zero.

(d) It is not defined.

Solution

4. The graph of the function f is shown here. Which one of these is a good estimate for the derivative of f at the indicated point?



(a) 3

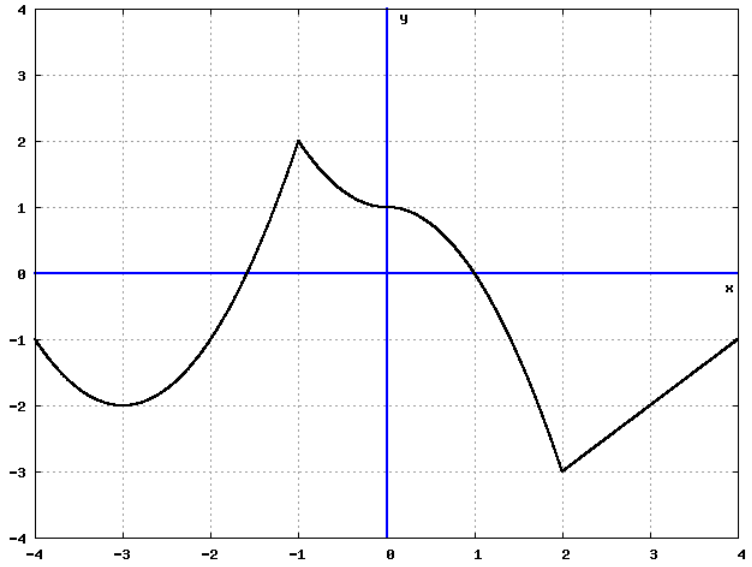
(b) 0

(c) 1

(d) It is not defined.

Solution

5. The graph of the function f is shown here. At how many points in the interval $(-4, 4)$ is the derivative of f equal to zero?



(a) 4

(b) 3

(c) 2

(d) 1

Solution

Problem 1 — The answer is (c).

At the points where $x = -1$ and $x = 2$, the tangent lines from the left are not the same as the tangent lines from the right. A function is not differentiable at points where the graph has sharp points.

Back to Problem 1

Problem 2 — The answer is (a).

At the indicated point, the tangent line will have positive slope.

Back to Problem 2

Problem 3 — The answer is (b).

At the indicated point, the tangent line will have negative slope.

Back to Problem 3

Problem 4 — The answer is (c).

On the interval from $x = 2$ to $x = 4$, the graph is a line. Therefore the graph is its own tangent line, and at the indicated point, the slope is 1.

Back to Problem 4

Problem 5 — The answer is (c).

The graph has horizontal tangent lines at two different places: $x = -3$ and $x = 0$.

Back to Problem 5