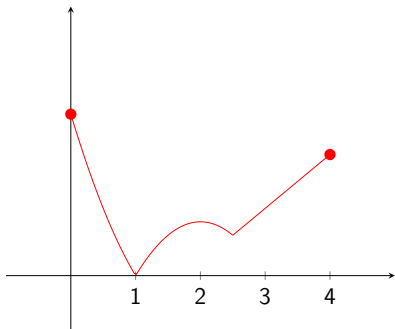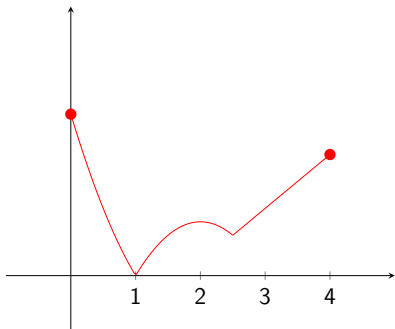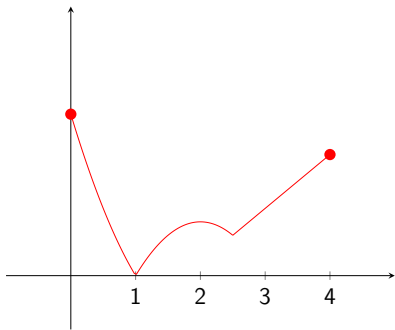1. The graph of a function f is depicted to the right. How many critical points does f have on the interval $[0, 4]$?

(A) None

(B) 1

(C) 2

(D) 3 ore more

1. The graph of a function f is depicted to the right. How many critical points does f have on the interval $[0, 4]$?
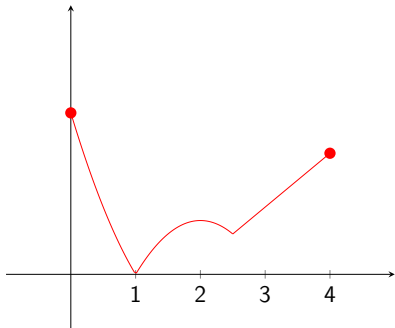
(A) None

(B) 1

(C) 2

(D) 3 ore more

Follow-up. Where are the absolute maximum and the absolute minimum of the function on the interval $[0, 4]$?

2. The graph of a function f is depicted to the right. On which of the following open intervals is $f'(x) > 0$?

(A) $(0, 1)$

(B) $(1, 2)$

(C) $(2, 2.5)$

(D) None of the above

3. The graph of a function f is depicted to the right. On which of the following open intervals is $f''(x) > 0$?

(A) $(0, 1)$

(B) $(1, 2.5)$

(C) Neither of the above

4. Let f be the function defined by

$$f(x) = \sin(x) + \cos(x).$$

How many critical points does f have on the interval $[0, \pi/2]$?

(A) 0

(B) 1

(C) 2

(D) 3 or more

4. Let f be the function defined by

$$f(x) = \sin(x) + \cos(x).$$

How many critical points does f have on the interval $[0, \pi/2]$?

(A) 0

(B) 1

(C) 2

(D) 3 or more

Follow-up. Where are the absolute maximum and the absolute minimum of f on the interval $[0, \pi/2]$?

5.   True or False?

There exists a function f that is defined on the closed interval $[0, 4]$ and which has an absolute maximum, but does not have an absolute minimum.

6.   True or False?

If f is a function such that $f'(x) > 0$ for all real numbers x, then it must be the case that
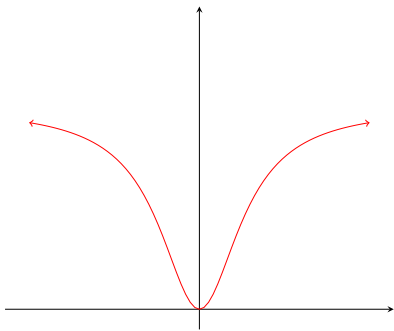
$$\lim_{x \to \infty} f(x) = \infty.$$

7.   The graph of a function f is depicted to the right. Which of the following could be a formula for the function?

(A) $f(x) = \dfrac{x^2}{x^2 + 1}$

(B) $f(x) = \dfrac{1}{x^2 + 1}$

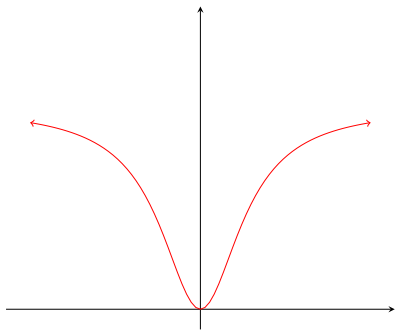(C) $f(x) = \dfrac{1}{x^2 - 1}$

(D) None of the above

7. The graph of a function f is depicted to the right. Which of the following could be a formula for the function?

(A) $f(x) = \dfrac{x^2}{x^2 + 1}$

(B) $f(x) = \dfrac{1}{x^2 + 1}$

(C) $f(x) = \dfrac{1}{x^2 - 1}$

(D) None of the above

Follow-up. Sketch graphs of (B) and (C).