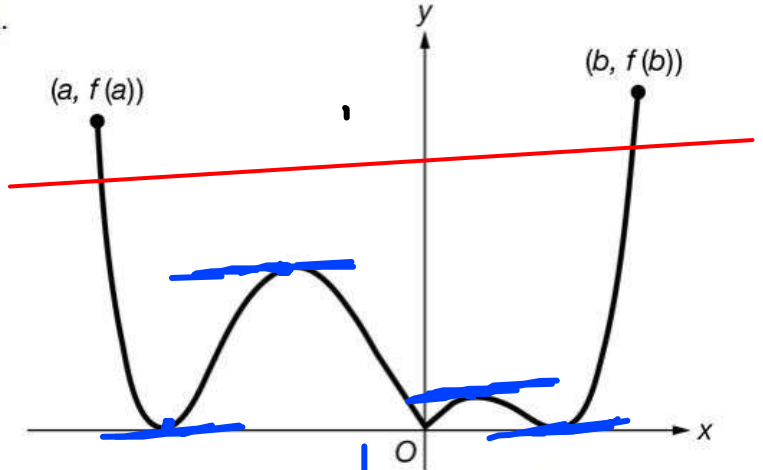
1.



The graph of a function f with $f(b) > f(a)$ is shown above for $a \le x \le b$. The derivative of f exists for all x in the interval $a < x < b$ except $x = 0$. For how many values of c, for $a < c < b$, does $\lim_{x \to c} \frac{f(x)-f(c)}{x-c} = \frac{f(b)-f(a)}{b-a}$?

(A) Zero
(B) Two
(C) Three
(D) Four

Tangent line = secant line

Therefore, they have the same slope

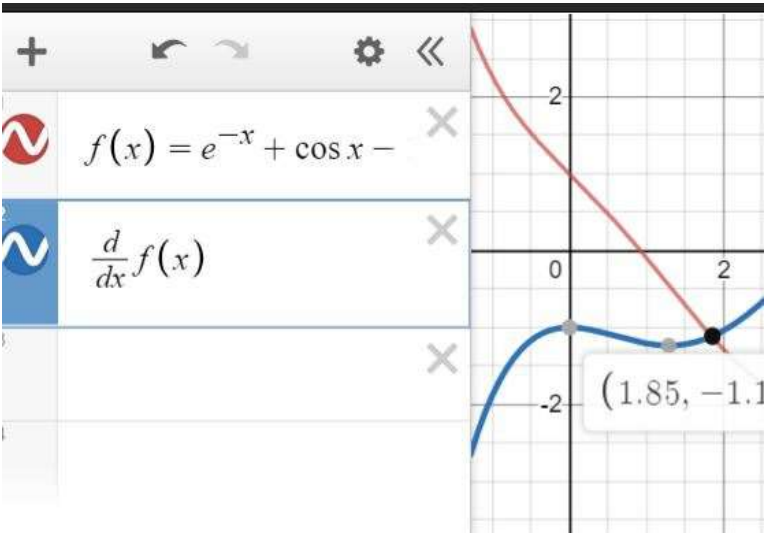
3. Let f be the function given by $f(x) = e^{-x} + \cos x - 1$. What is the value of $f'(2)$?

(A) -1.281

(B) -1.140

(C) -1.045

(D) -1



4. Let f be the function given by $f(x) = x^4 + x^3 - 3x^2 - x - \cos(x^2)$. Of the following values of x, at which does the line tangent to the graph of f have the greatest slope?

(A) $x = -2$. -5.793

(B) $x = -1$. 2.317

(C) $x = 0$. -1

(D) $x = 1$. 1.683

1 $\frac{d}{dx} f(x)$

2 $f(x) = x^4 + x^3 - 3x^2 - x - \cos(x^2)$

3