Test A Chapter 2.1-2.4 Name_____

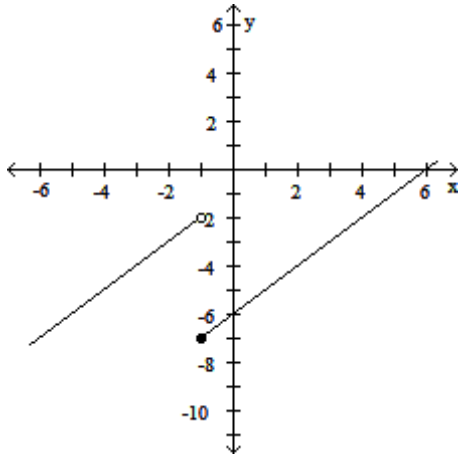
Determine the limit by substitution.

1) $\lim_{x \to 0} \frac{x^3 - 6x + 8}{x - 2}$

A) -4 B) 4 C) 0 D) Does not exist

Determine the limit graphically, if it exists.

2) Find $\lim_{x \to 1^-} f(x)$ and $\lim_{x \to 1^+} f(x)$ and $\lim_{x \to 1} f(x)$



A) -2; -7, DNE B) -7; -5, DNE C) -5; -2, DNE D) -7; -2, DNE

Provide an appropriate response.

3) Find $\lim_{x \to 0} x \cos(\frac{1}{x})$

A) 1 B) 0.0007 C) Does not exist D) 0

Find the limit, if it exists.

4) $\lim_{x \to \infty} \frac{x^2 + 8x + 7}{x^3 - 9x^2 + 11}$

A) 1 B) ∞ C) $\frac{7}{11}$ D) 0

5) $\lim_{x \to \infty} \frac{-8x^2 + 9x + 6}{-15x^2 + 7x + 17}$

A) $\frac{6}{17}$ B) ∞ C) $\frac{8}{15}$ D) 1

6) $\lim_{x \to -\infty} \frac{5x^3 + 4x^2}{x - 5x^2}$

A) $-\frac{4}{5}$ B) 5 C) $-\infty$ D) ∞

7) $\lim_{x \to \infty} \frac{\cos 4x}{x}$

A) ∞ B) 4 C) 1 D) 0

8) $\lim_{x \to \infty} \frac{-3 + \left(\frac{2}{x}\right)}{6 - \left(\frac{1}{x^2}\right)}$

A) $\frac{1}{2}$ B) $-\frac{1}{2}$ C) ∞ D) ∞

Find the indicated limit.

9) $\lim_{x \to \infty} \frac{\sin(3x)}{x}$

A) 0 B) 1 C) ∞ D) 3

Find the limit.

10) $\lim_{x \to (-2)^+} \frac{1}{x + 2}$

A) 1/2 B) -1/2 C) ∞ D) $-\infty$

11) $\lim_{x \to (\pi/2)^+} \tan x$

A) ∞ B) 0 C) $-\infty$ D) 1

Find the average rate of change of the function over the given interval.

12) $f(x) = x^2 + 5x, \quad [1, 8]$

A) 14 B) 13 C) $\frac{49}{4}$ D) $\frac{104}{7}$

13) Given the function $x^2 - 8x + 17$ and the point (3, 2), which limit would you choose to begin the process of finding the derivative .

A) $\lim_{h \to 0} \frac{(3+h)^2 - 8(3+h) + 17 - 2}{h-3}$

B) $\lim_{h \to 0} \frac{(3+h)^2 - 8(3+h) + 17 + 2}{h}$

C) $\lim_{h \to 0} \frac{(3+h)^2 - 8(3+h) + 17 - 2}{h}$

D) $\lim_{h \to 3} \frac{(3+h)^2 - 8(3+h) + 17 + 2}{h}$

14) Given the function $x^2 - 8x + 17$ and the point (3, 2), which limit would you choose to begin the process of finding the derivative .

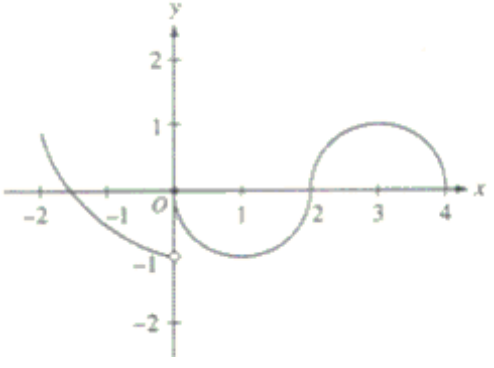
A) $\lim_{x \to 3} \frac{x^2 - 8x + 17 + 2}{x}$

B) $\lim_{x \to 3} \frac{x^2 - 8x + 17 + 2}{x-3}$

C) $\lim_{x \to 3} \frac{x^2 - 8x + 17 - 2}{x+3}$

D) $\lim_{x \to 3} \frac{x^2 - 8x + 17 - 2}{x-3}$

15) The graph of the function f shown in the figure above has a vertical tangent at the point (2, 0) and horizontal tangents at the points (1, -1) and (3, 1). For what values of x from $-2 < x < 4$ is f not differentiable.



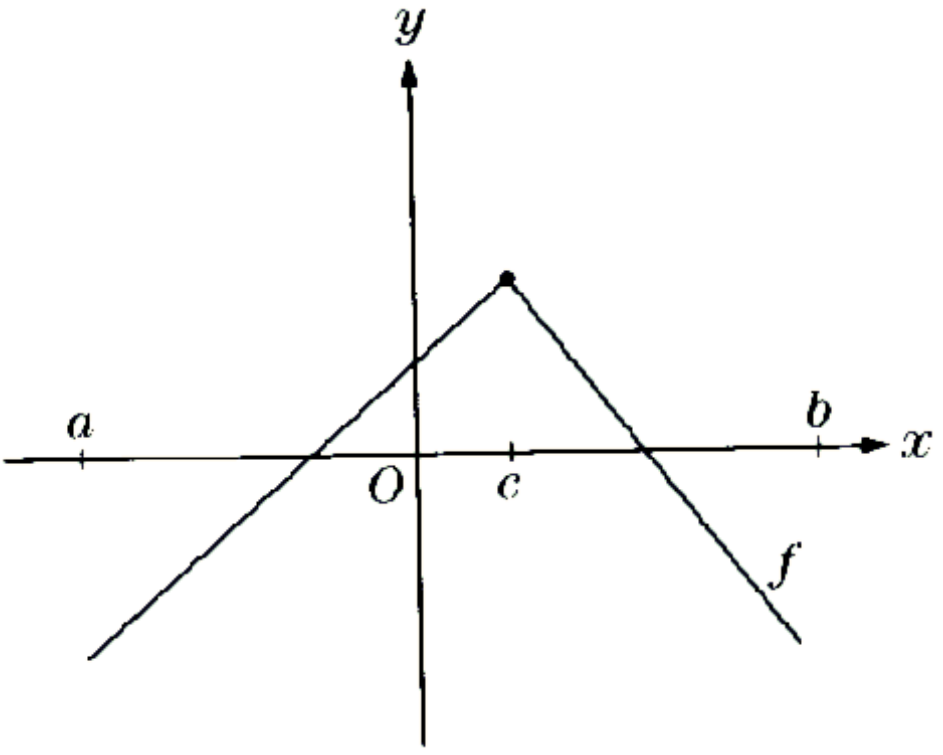
a. 0 only

b. 0 and 2 only

c. 1 and 3 only

d. 0, 1, and 3 only

e. 0, 1, 2, and 3



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The function f, whose graph consists of two line segments, is shown. Which of the following are tru
the open interval (a, b)?

I. The domain of the derivative of f is the open interval (a, b)
II. f is continuous on the open interval (a,b)
III. The derivative of f is positive on the open interval (a, c)

a) I only
b) II only
c) III only
d) II and III only
e) I, II, and III