CENGAGE | WEBASSIGN

EN

scott.sutherland@stonybrook.edu Sign out

MAT125 HW5 - The derivative function (Homework)

Due Date: MON, SEP 28, 2026 8:00 AM EDT

Current Score: – / 30 POINTS | 0.0 %

Scoring and Assignment Information

QUESTION	1	2	3	4	5	6	7	8	9	10	11	12	13	14
POINTS	– / 1	– / 1	– / 1	– / 1	– / 1	– / 1	– / 1	– / 1	– / 1	– / 1	– / 1	– / 1	– / 1	– / 1

Assignment Submission

For this assignment, you submit answers by question parts. The number of submissions remainin

Assignment Scoring

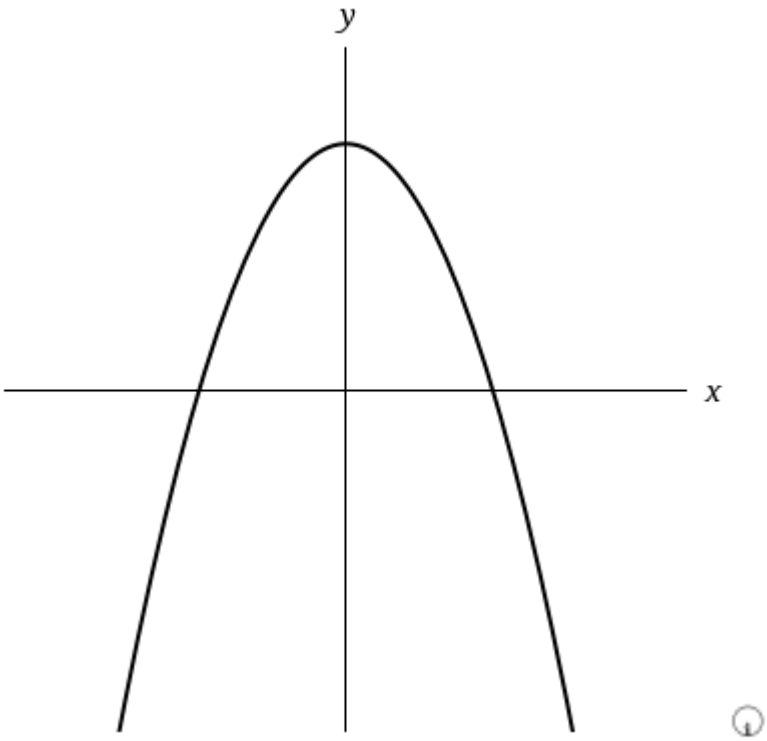
Your last submission is used for your score.

1. [– / 1 Points]

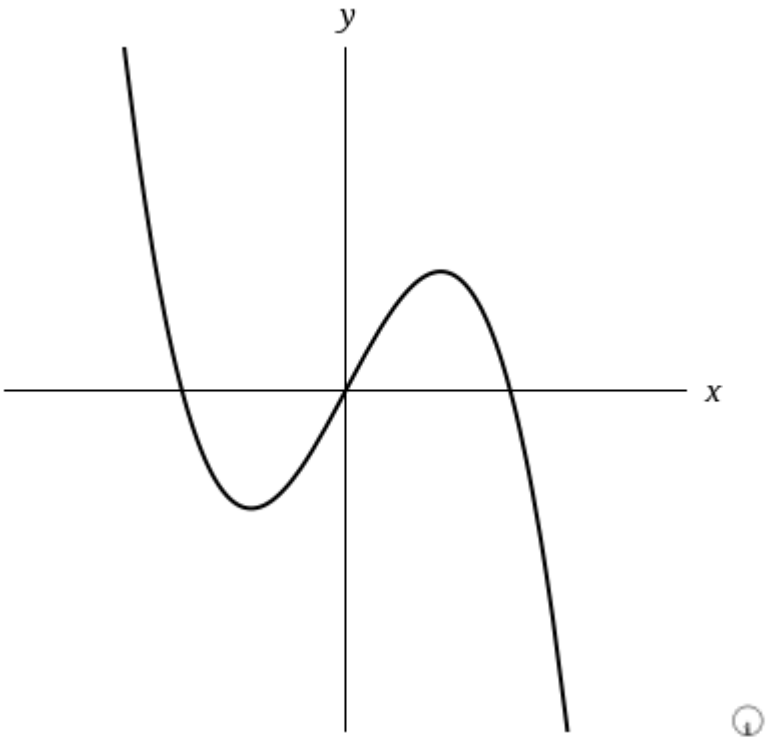
SCalcCC5 2.7.003.MI.

Match the graph of each function in (a)–(d) with the graph of its derivative in I–IV.

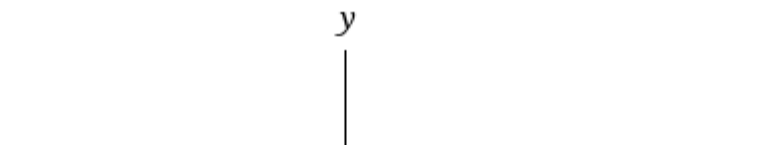
I

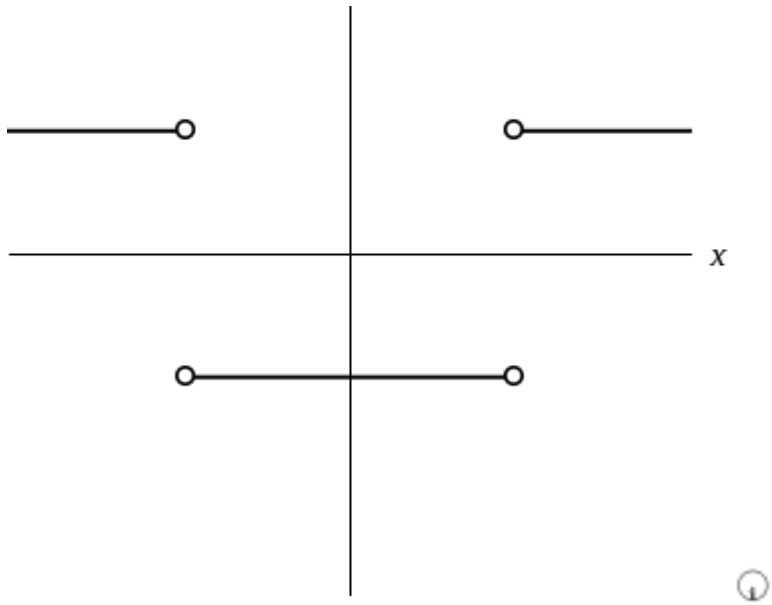


II

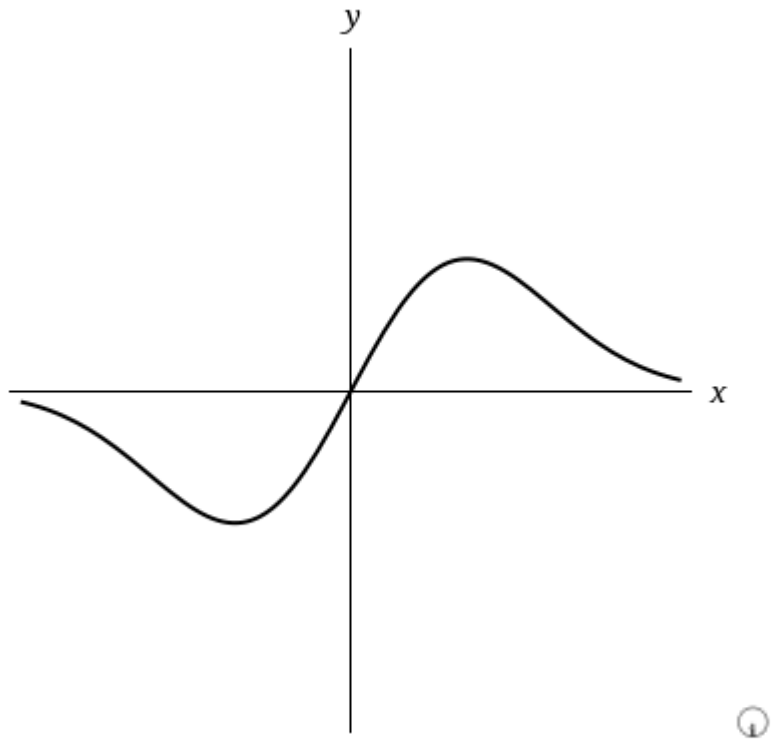


III

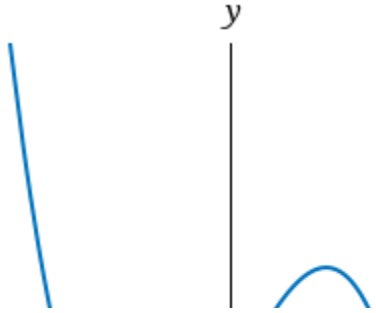


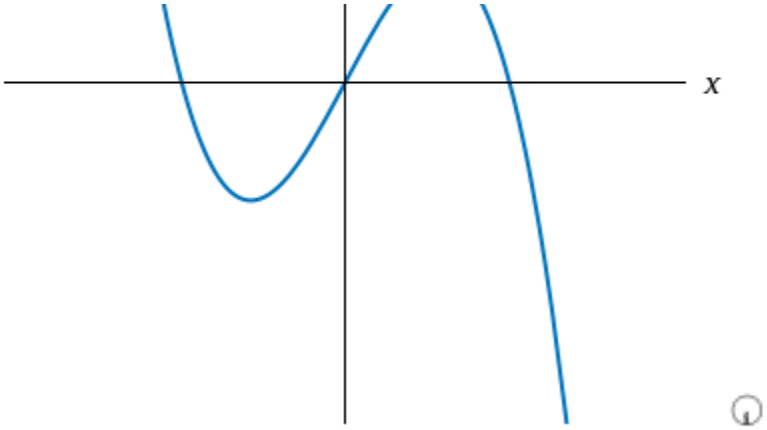


IV



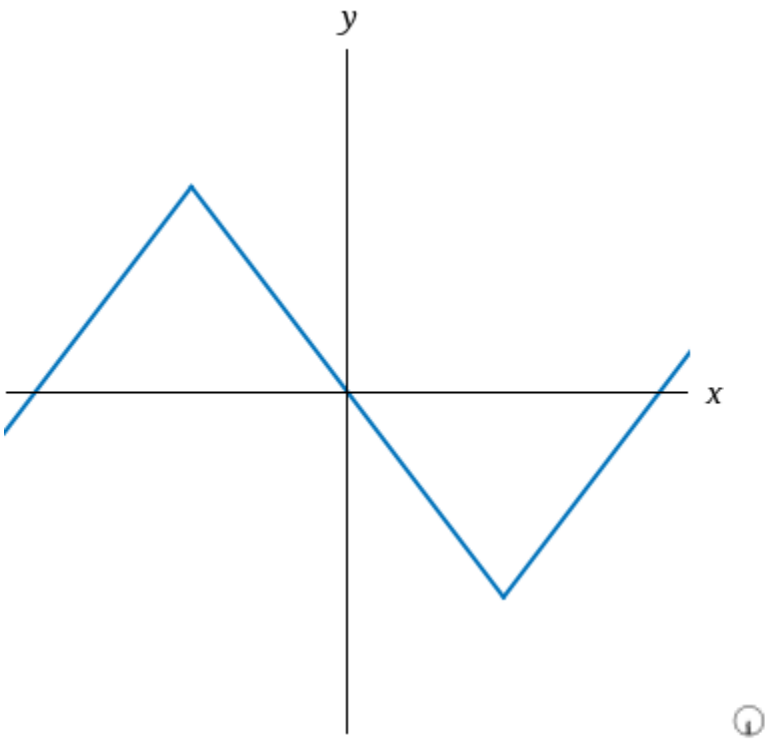
(a)





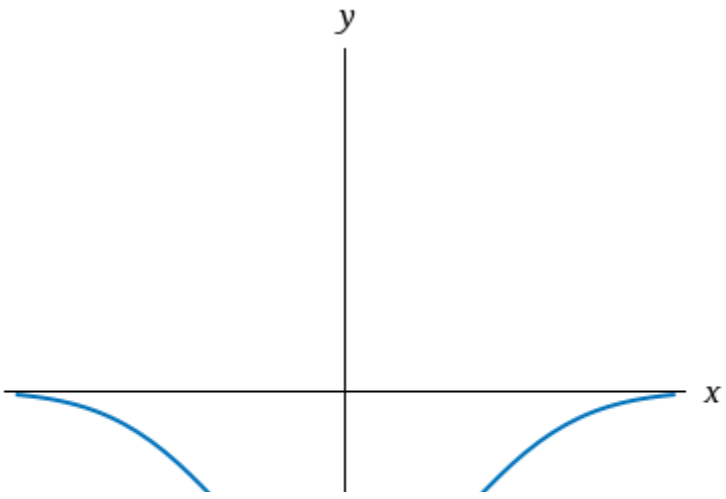
? ⌄

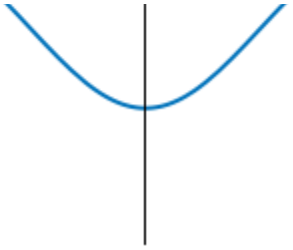
(b)



? ⌄

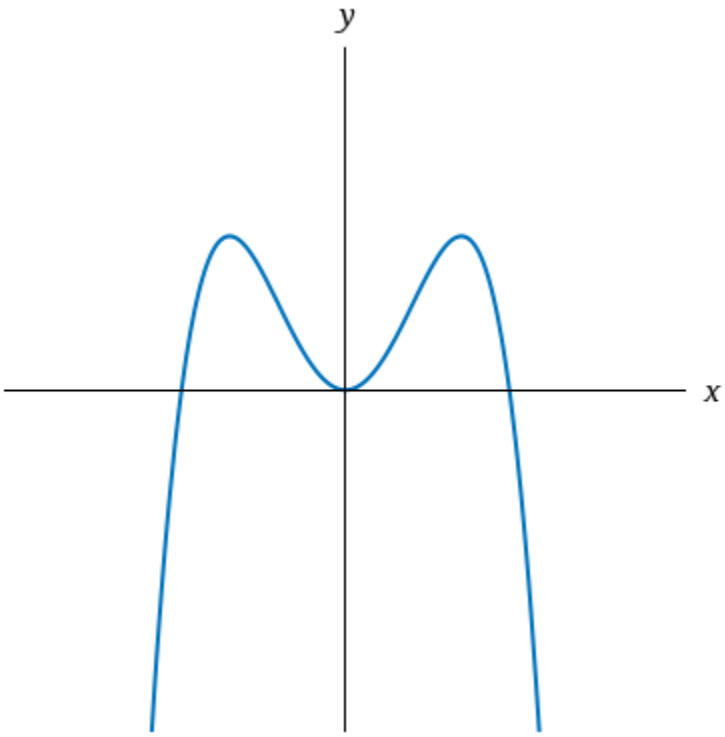
(c)





?

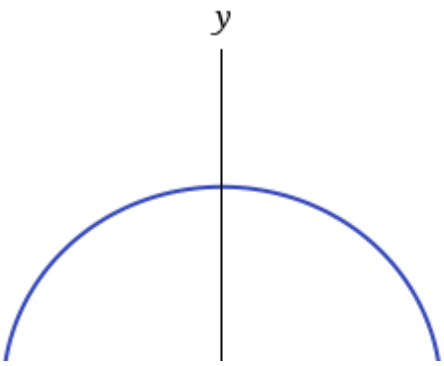
(d)

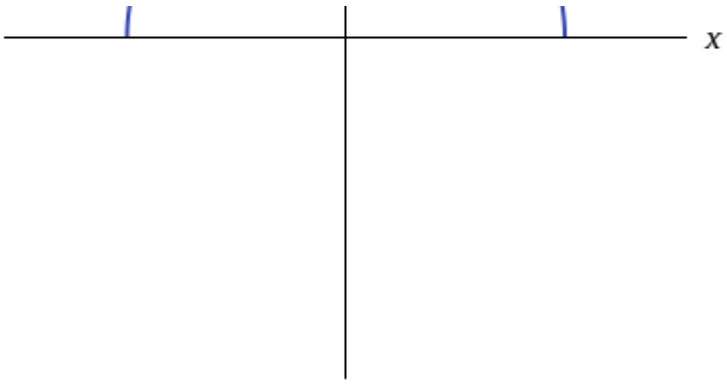


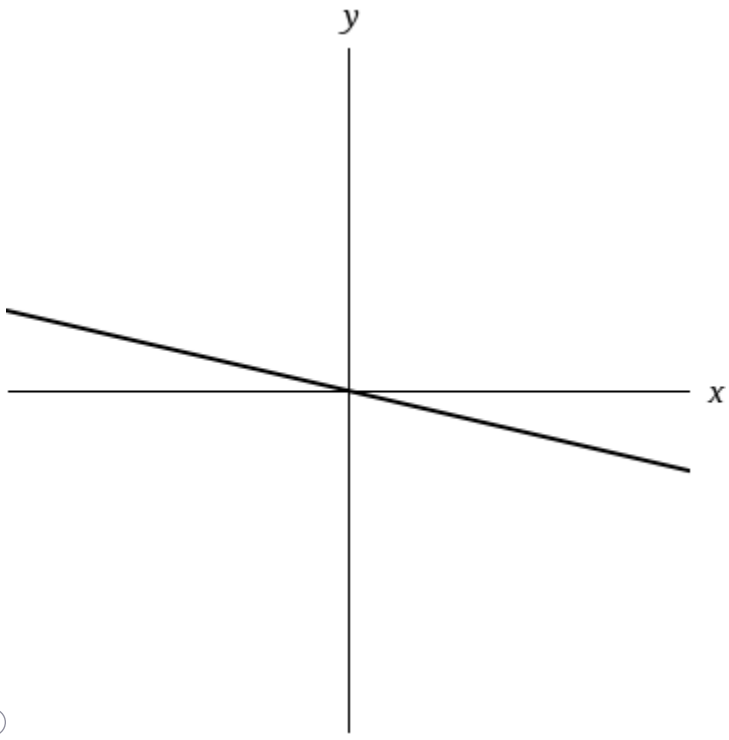
?

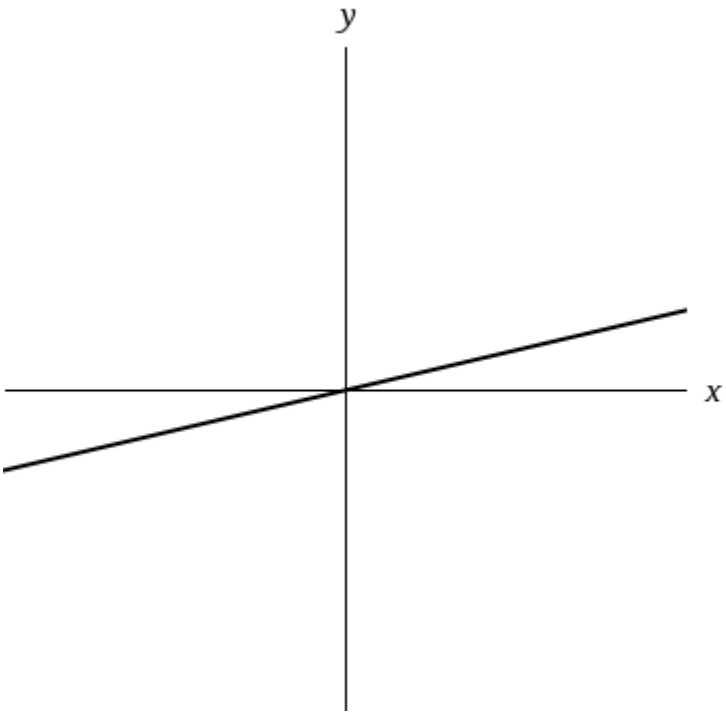
2. [– / 1 Points]

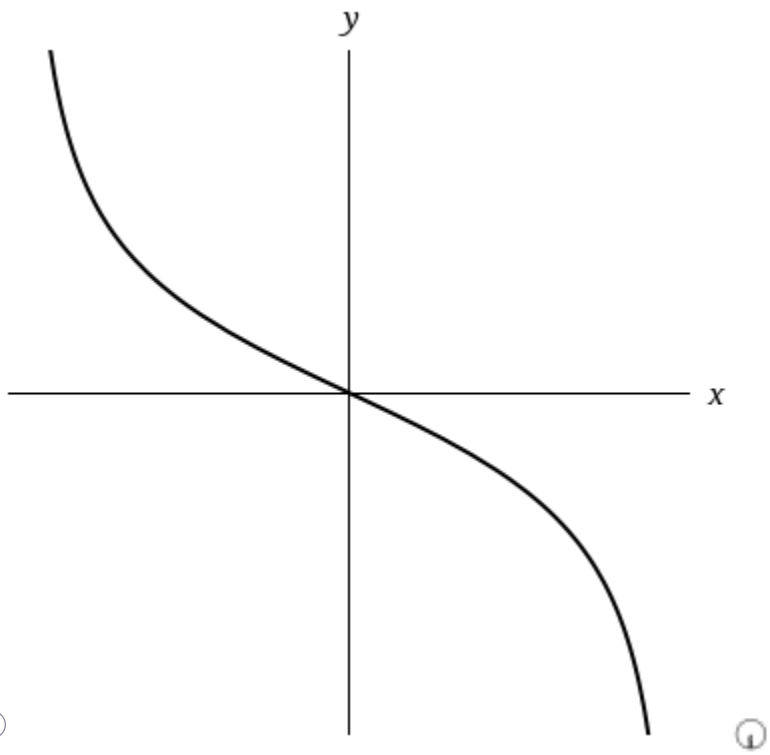
Trace or copy the graph of the given function *f*. Assume that the axes have equal scales. Use estimates o

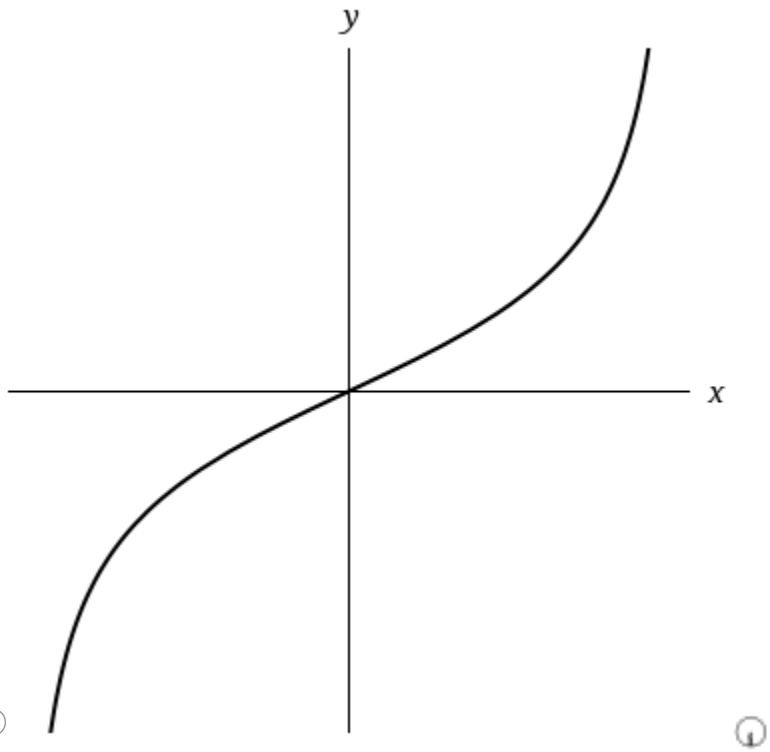



x


y
x

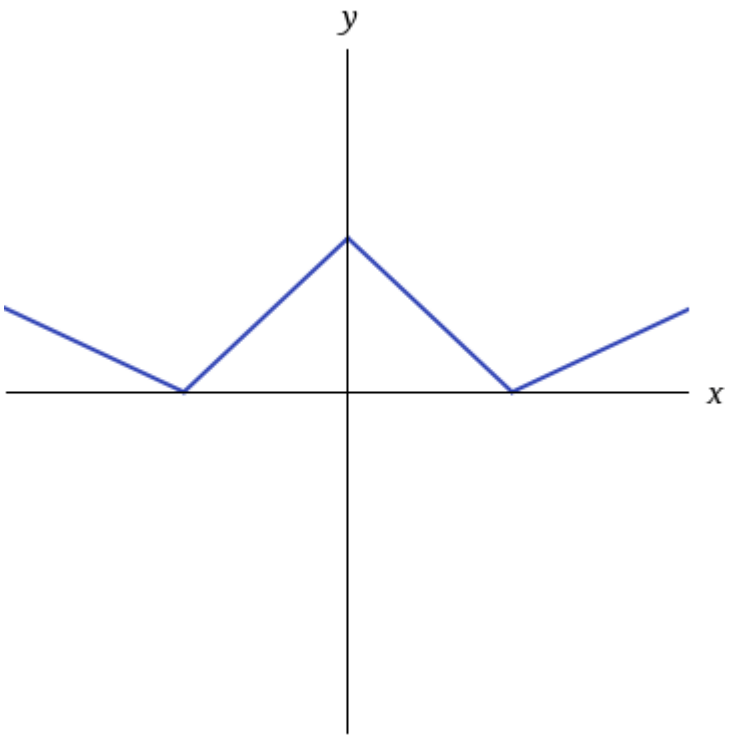

y
x

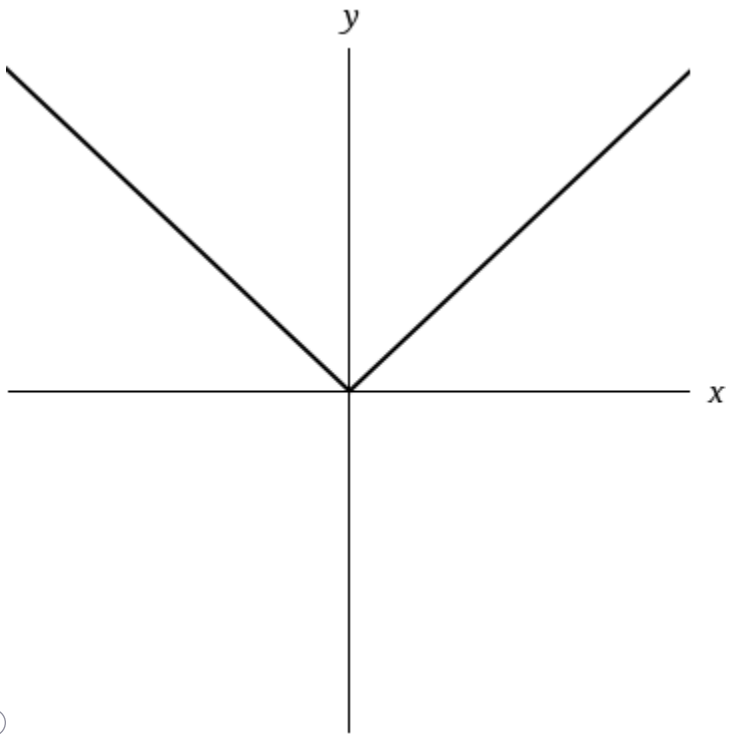




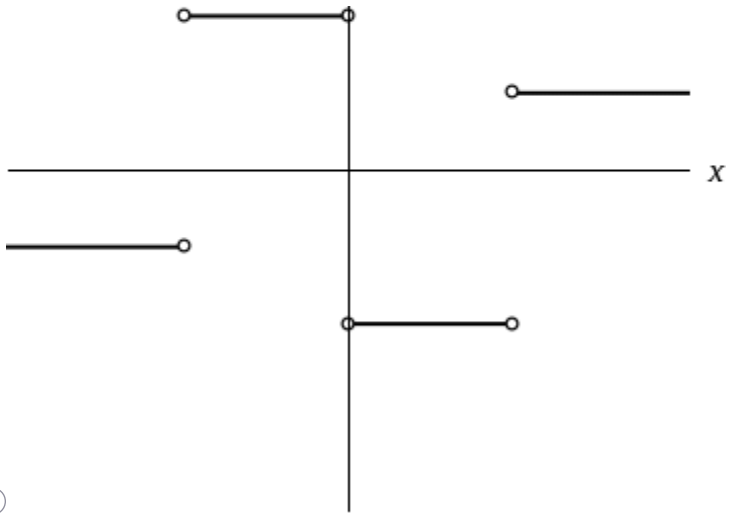
3. **[– / 1 Points]**

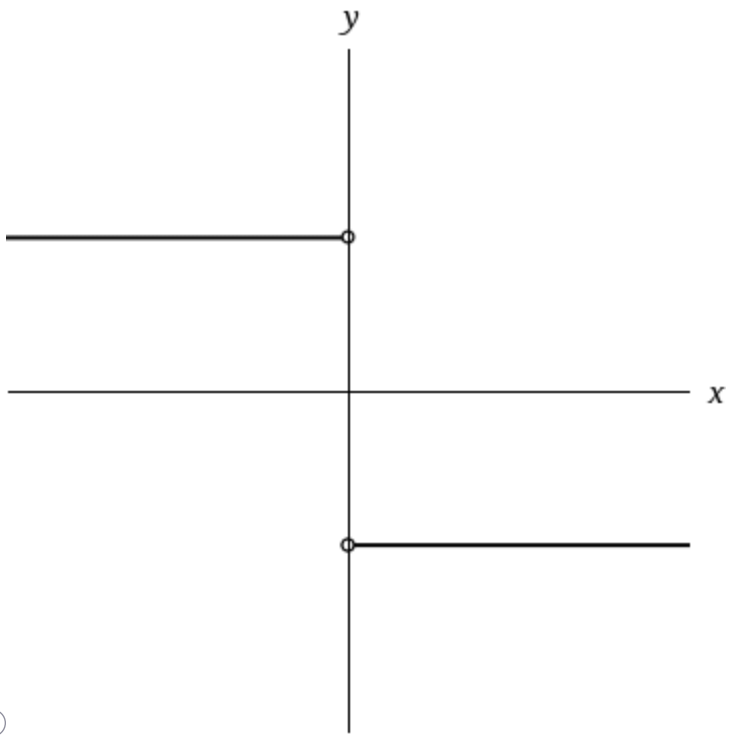
Trace or copy the graph of the given function *f*. Assume that the axes have equal scales. Use estimates o

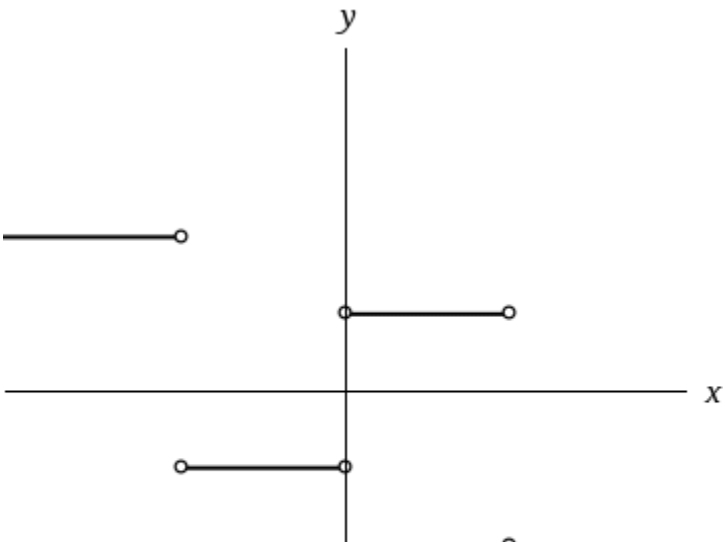


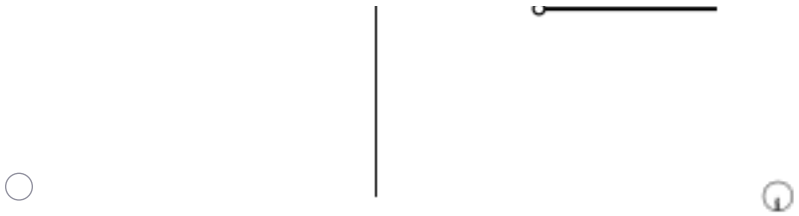





x

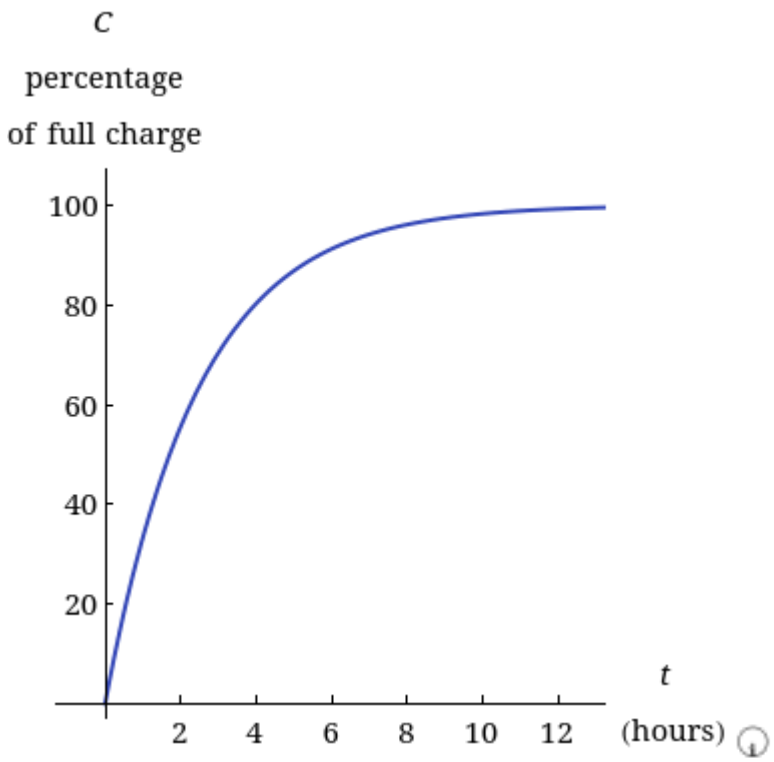

y
x


y
x



4. [– / 1 Points]

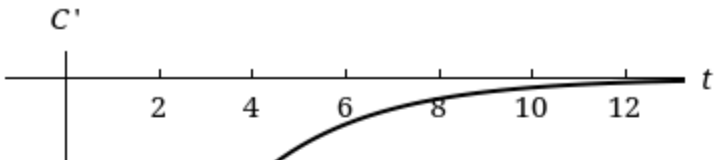
A rechargeable battery is plugged into a charger. The graph shows $C(t)$, the percentage of full capacity th

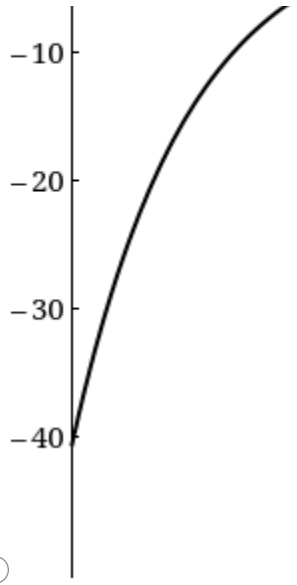


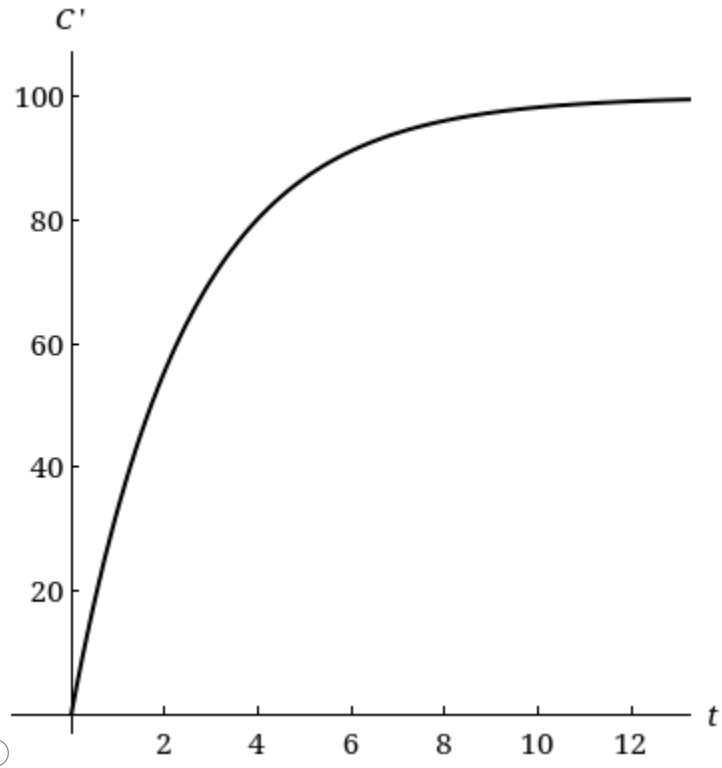
(a) What is the meaning of the derivative $C'(t)$?

- $C'(t)$ is elapsed time in hours required for a given percentage of full capacity to be reached.
- $C'(t)$ is the average rate of change of percentage of full capacity with respect to elapsed time
- $C'(t)$ is the total percentage of full capacity with respect to elapsed time in hours.
- $C'(t)$ is the instantaneous rate of change of percentage of full capacity with respect to elapse

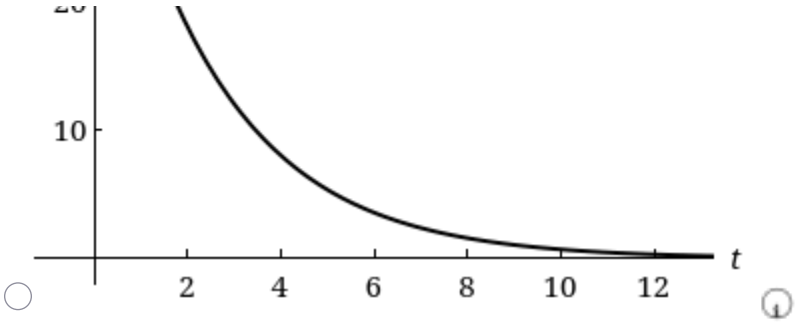
(b) Sketch the graph of $C'(t)$.

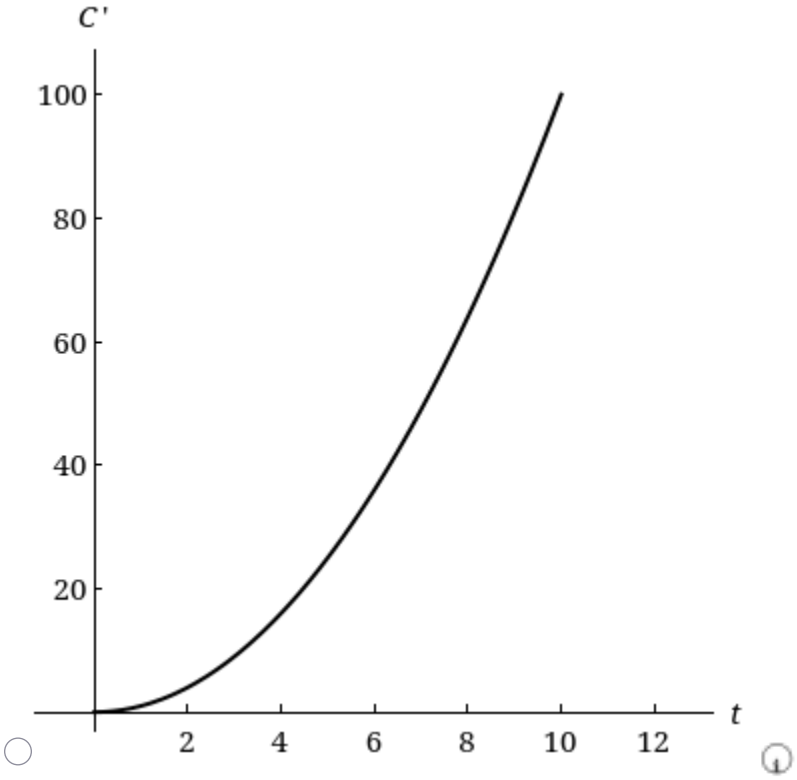



−10
−20
−30
−40


C'
100
80
60
40
20
2
4
6
8
10
12
t


C'
40
30





What does the graph tell you?

- The graph of $C'(t)$ tells us that the rate of change of percentage of full capacity is decreasing
- The graph of $C'(t)$ tells us that the rate of change of percentage of full capacity is increasing
- The graph of $C'(t)$ tells us that the rate of change of percentage of full capacity is decreasing
- The graph of $C'(t)$ tells us that the rate of change of percentage of full capacity is increasing
- The graph of $C'(t)$ tells us that the rate of change of percentage of full capacity is increasing

---

5. [– / 1 Points]

SCalcCC5 2.7.025.

Find the derivative of the function using the definition of derivative.

$f(x) = 4 + 8x - 7x^2$

$f'(x) =$

State the domain of the function. (Enter your answer using interval notation.)

State the domain of its derivative. (Enter your answer using interval notation.)

---

6. [– / 1 Points]

SCalcCC5 2.7.028.

Find the derivative of the function using the definition of derivative.

$$g(x) = \sqrt{1 - x}$$

$g'(x) =$

State the domain of the function. (Enter your answer using interval notation.)

State the domain of its derivative. (Enter your answer using interval notation.)

---

7. [– / 1 Points]

SCalcCC5 2.7.033.

If $f(x) = 5x^3 - 4x^2$, find $f''(x)$ using the limit definition.

- ○ $30x$
- ○ 30
- ○ $30x - 8h$
- ○ $30x - 8$

---

8. [– / 1 Points]

Let P represent the percentage of a city's electrical power that is produced by solar panels t years after Ja

(a) What does $\frac{dP}{dt}$ represent in this context?

- dP/dt is the rate at which the time t changes with respect to the percentage of the city's elect
- dP/dt is the rate at which the percentage of the city's electrical power produced by solar pane
- dP/dt is the percent of the city's electrical power produced by solar panels P with respect to ti
- dP/dt is the rate at which the city's electrical power produced by solar panels P changes with
- dP/dt is the time t with respect to the percentage of the city's electrical power produced by sc
- dP/dt is the rate at which the time t changes with respect to the city's electrical power produc

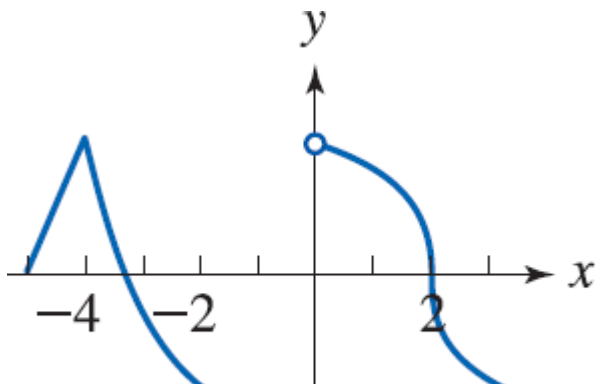
(b) Interpret the following statement.

$$\left.\frac{dP}{dt}\right|_{t = 7} = 2.5$$

- Seven years after January 1, 2020, the amount of electrical power produced by solar panels v
- Two and a half years after January 1, 2020, the percentage of electrical power produced by sc
- Seven years after January 1, 2020, the percentage of electrical power produced by solar pane
- Two and a half years after January 1, 2020, the percentage of electrical power produced by sc
- Seven years after January 1, 2020, the percentage of electrical power produced by solar pane
- Two and a half years after January 1, 2020, the amount of electrical power produced by solar

9. [– / 1 Points]

The graph of f is given. State the numbers at which f is not differentiable. (Enter your answers as a comn





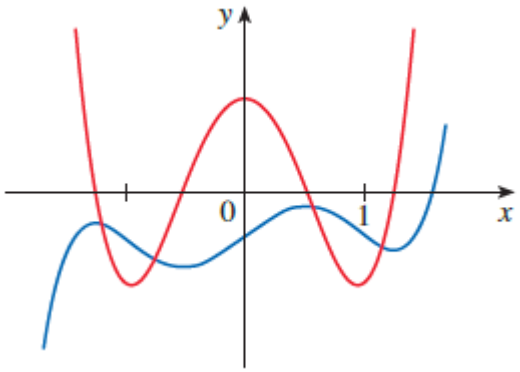
$x =$

---

10. [– / 1 Points]

SCalcCC5 2.7.051.EP.

The graphs of a function f and its derivative f' are shown.



The graph of f has a ---Select--- y-intercept.

The value of $f'(-1)$ is ---Select--- because ---Select---.

The value of $f''(1)$ is ---Select--- because ---Select---.

Which is bigger, $f'(-1)$ or $f''(1)$?

- $f'(-1)$
- $f''(1)$

---

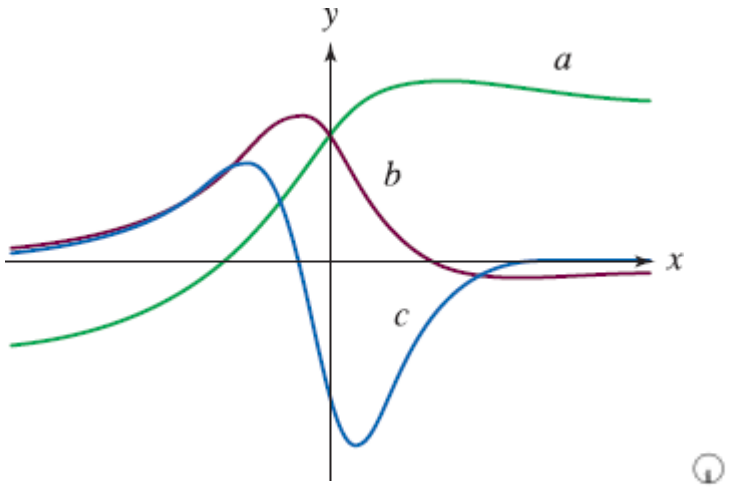
11. [– / 1 Points]

SCalcCC5 2.7.053.

The figure shows the graphs of f, f', and f''. Identify each curve, and explain your choices.

Figure	Description

Figure Description



f ?
f' ?
f'' ?

---

12. [– / 1 Points]

SCalcCC5 2.7.057.

Use the definition of derivative to find $f'(x)$ and $f''(x)$.

$$f(x) = 4x^2 + 7x + 3$$

$f'(x)$ =

$f''(x)$ =

---

13. [– / 1 Points]

SCalcCC5 2.7.060.

Let $f(x) = |x + 3| - |4x - 8|$. What is the value of $f'(-1)$?

- 1
- 3
- 5
- −3

14. [– / 1 Points]

SCalcCC5 3.1.005.

Differentiate the function.

$$f(x) = 5.2x + 2.8$$

$f'(x) =$ [ ]

15. [– / 1 Points]

SCalcCC5 3.1.006.

Differentiate the function.

$$f(x) = \frac{3}{4}x^2 - 9x + 14$$

$f'(x) =$ [ ]

16. [– / 1 Points]

SCalcCC5 3.1.001.

A graphing calculator is recommended.

(a) How is the number e defined?

- ○ e is the number such that $\lim_{h \to 0} \frac{e^{-h} - 1}{h} = 1$.
- ○ e is the number such that $\lim_{h \to 1} \frac{e^{-h} - 1}{h} = 1$.
- ○ e is the number such that $\lim_{h \to 0} \frac{e^{h} + 1}{h} = 1$.
- ○ e is the number such that $\lim_{h \to 0} \frac{e^{h} - 1}{h} = 1$.
- ○ e is the number such that $\lim_{h \to \infty} \frac{e^{h} + 1}{h} = 1$.

(b) Use a calculator to estimate the values of the limits correct to two decimal places.

$$\lim_{h \to 0} \frac{2.7^h - 1}{h} = \square$$

$$\lim_{h \to 0} \frac{2.8^h - 1}{h} = \square$$

What can you conclude about the value of e?

- ◯ $0.99 < e < 1.03$
- ◯ $2.7 < e < 2.8$
- ◯ $1.03 < e < 2.7$
- ◯ $0.99 < e < 2.7$
- ◯ $0 < e < 1$

---

17. [– / 1 Points]

SCalcCC5 3.1.020.

Differentiate the function.

$$S(R) = 6\pi R^2$$

$S'(R) =$ ☐

---

18. [– / 1 Points]

SCalcCC5 2.TF.001.

Determine whether the statement is true or false.

$$\lim_{x \to 4} \left(\frac{2x}{x-4} - \frac{8}{x-4} \right) = \lim_{x \to 4} \frac{2x}{x-4} - \lim_{x \to 4} \frac{8}{x-4}$$

- ◯ True
- ◯ False

---

19. [– / 1 Points]

SCalcCC5 2.TF.002.

Determine whether the statement is true or false.

$$\lim_{x \to 1} \frac{x^2 + 3x - 4}{x^2 + 2x - 3} = \frac{\lim_{x \to 1} \left(x^2 + 3x - 4\right)}{\lim_{x \to 1} \left(x^2 + 2x - 3\right)}$$

- ◯ True
- ◯ False

---

20. [– / 1 Points]

SCalcCC5 2.TF.003.

Determine whether the statement is true or false.

$$\lim_{x \to 1} \frac{x - 8}{x^2 + 2x - 4} = \frac{\lim_{x \to 1} \left(x - 8\right)}{\lim_{x \to 1} \left(x^2 + 2x - 4\right)}$$

- ◯ True
- ◯ False

---

21. [– / 1 Points]

SCalcCC5 2.TF.004.

Determine whether the statement is true or false.

$$\frac{x^2 - 64}{x - 8} = x + 8$$

- ◯ True
- ◯ False

---

22. [– / 1 Points]

SCalcCC5 2.TF.014.

Determine whether the statement is true or false.

If $\lim_{x \to 3} [f(x)g(x)]$ exists, then the limit must be $f(3)g(3)$.

- ◯ True
- ◯ False

23. **[– / 1 Points]**

SCalcCC5 2.TF.013.

Determine whether the statement is true or false.

If $\lim_{x \to a} f(x)$ exists but $\lim_{x \to a} g(x)$ does not exist, then $\lim_{x \to a} [f(x) + g(x)]$ does not exist.

- ◯ True
- ◯ False

24. **[– / 1 Points]**

SCalcCC5 2.TF.017.

Determine whether the statement is true or false.

A function can have two different horizontal asymptotes.

- ◯ True
- ◯ False

25. **[– / 1 Points]**

SCalcCC5 2.TF.0

Determine whether the statement is true or false.

If f has domain $[0, \infty)$ and has no horizontal asymptote, then $\lim_{x \to \infty} f(x) = \infty$ or $\lim_{x \to \infty} f(x) =$

- ◯ True
- ◯ False

26. **[– / 1 Points]**

SCalcCC5 2.TF.019.

Determine whether the statement is true or false.

If the line $x = 9$ is a vertical asymptote of $y = f(x)$, then f is not defined at 9.

If the line $x = 5$ is a vertical asymptote of $y = f(x)$, then f is not defined at 5.

- ◯ True
- ◯ False

---

27. [– / 1 Points]

SCalcCC5 2.TF.021.

Determine whether the statement is true or false.

If f is continuous at 5 and $f(5) = 9$ and $f(4) = 3$, then $\lim_{x \to 2} f(4x^2 - 11) = 9$.

- ◯ True
- ◯ False

---

28. [– / 1 Points]

SCalcCC5 2.TF.501.XP.

Determine whether the statement is true or false.

If $f'(r)$ exists, then $\lim_{x \to r} f(x) = f(r)$.

- ◯ True
- ◯ False

---

29. [– / 1 Points]

SCalcCC5 2.TF.026.

Determine whether the statement is true or false.

If f is continuous at a, so is $|f|$.

- ◯ True
- ◯ False

---

30. [– / 1 Points]

SCalcCC5 2.TF.027.

Determine whether the statement is true or false.

If $|f|$ is continuous at a, so is f.

- ○ True
- ○ False

Home My Assignments

Copyright © 1998 - 2026 Cengage Learning, Inc. All Righ