

2.2 Basic Differentiation Rules and Rates of Change (2047326)

Question

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1. Question Details

LarCalc9 2.2.003. [1196956]

Use the rules of differentiation to find the derivative of the function.

$$y = 11$$

 $y' =$

2. Question Details

LarCalc9 2.2.006. [1047588]

Use the rules of differentiation to find the derivative of the function.

$$h(x) = 8x^8$$

 $h'(x) =$

3. Question Details

LarCalc9 2.2.009. [1047606]

Use the rules of differentiation to find the derivative of the function.

$$f(x) = \sqrt[6]{x}$$

 $f'(x) =$

4. Question Details

LarCalc9 2.2.013. [1385860]

Use the rules of differentiation to find the derivative of the function.

$$f(t) = 6t^2 - 8t - 4$$

 $f'(t) =$

5. Question Details

LarCalc9 2.2.018. [1197657]

Use the rules of differentiation to find the derivative of the function.

$$f(x) = 3x^3 - x^2 + 2x - 6$$

 $f'(x) =$

6. Question Details

LarCalc9 2.2.019. [1047694]

Use the rules of differentiation to find the derivative of the function.

$$y = \frac{\pi}{2} \cos(\theta) - \sin(\theta)$$

 $y' =$

7. Question Details

LarCalc9 2.2.022. [1047637]

Use the rules of differentiation to find the derivative of the function.

$$y = 5 + 5 \sin(x)$$

$$y'(x) = \boxed{5 \cos(x)}$$

8. Question Details

LarCalc9 2.2.024. [1196733]

Use the rules of differentiation to find the derivative of the function.

$$y = \frac{8}{(3x)^3} + 2 \cos(x)$$

$$y' = \boxed{-\frac{8}{9} \cdot \frac{1}{x^4} - 2 \cdot (\sin(x))}$$

9. Question Details

LarCalc9 2.2.025. [1197521]

Complete the table.

Original Function	$y = \frac{8}{3x^2}$
Rewrite	$y = \boxed{} \cdot \frac{8}{3} x^{\boxed{-2}}$
Differentiate	$y' = \boxed{-\frac{16}{3}x^{-3}}$
Simplify	$y' = \boxed{-\frac{16}{3x^3}}$

10. Question Details

LarCalc9 2.2.026.MI. [1267209]

Find the derivative.

$$y = \frac{7}{4x^9}$$

$$y' = \boxed{-\frac{63}{4x^{10}}}$$

11. Question Details

LarCalc9 2.2.028. [1197345]

Complete the table.

Original Function	$y = \frac{\pi}{(8x)^2}$
Rewrite	$\boxed{\frac{\pi}{64}} x^{\boxed{-2}}$
Differentiate	$\boxed{-\frac{\pi}{32}x^{-3}}$
Simplify	$\boxed{-\frac{\pi}{32x^3}}$

12. Question Details

LarCalc9 2.2.029. [1197172]

Complete the table.

Original Function	$\frac{9\sqrt{x}}{x}$	
Rewrite	$y = $ <input type="text" value="9"/> x <input type="text" value="-1/2"/>	
Differentiate	$y' = $	<input type="text" value="-9/2 x^{-3/2}"/>
Simplify	$y' = $	<input type="text" value="-9/(2x^{3/2})"/>

13. Question Details

LarCalc9 2.2.030. [1196667]

Find the derivative.

Original Function	$y = \frac{2}{x^{-4}}$	
Rewrite	<input type="text" value="2"/> x <input type="text" value="4"/>	
Differentiate		<input type="text" value="8x^3"/>
Simplify		<input type="text" value="8x^3"/>

14. Question Details

LarCalc9 2.2.032. [1047709]

Find the slope of the graph of the function at the given point. Use the *derivative* feature of a graphing utility to confirm your results.

$$f(t) = 2 - \frac{9}{5t}, \quad \left(\frac{3}{4}, \frac{-2}{5}\right)$$

$$f'(3/4) = \text{}$$

15. Question Details

LarCalc9 2.2.037. [1047696]

Find the slope of the graph of the function at the given point. Use the *derivative* feature of a graphing utility to confirm your results.

$$f(\theta) = 7 \sin(\theta) - \theta, \quad (0, 0)$$

$$f'(0) = \text{}$$

16. Question Details

LarCalc9 2.2.040. [1047623]

Find the derivative of the function.

$$f(x) = 3x^2 - 3x - 5x^{-2}$$

$$f'(x) = \text{}$$

17. Question Details

LarCalc9 2.2.041. [1197512]

Find the derivative of the function.

$$g(t) = t^2 - \frac{8}{t^3}$$

 $g'(t) =$

$$2t + \frac{24}{t^4}$$

18. Question Details

LarCalc9 2.2.043.MI. [1341720]

Find the derivative of the function.

$$f(x) = \frac{5x^3 + 3x^2}{x}$$

 $f'(x) =$

$$10x + 3$$

19. Question Details

LarCalc9 2.2.043.MI.SA. [1419676]

This question has several parts that must be completed sequentially. If you skip a part of the question, you will not receive any points for the skipped part, and you will not be able to come back to the skipped part.

Tutorial Exercise

Find the derivative of the function.

$$f(x) = \frac{6x^3 + 8x^2}{x}$$

20. Question Details

LarCalc9 2.2.046. [1197437]

Find the derivative of the function.

$$f(x) = \frac{5x^2 - 5x + 6}{x}$$

 $f'(x) =$

$$\frac{5 \cdot x^2 - 6}{x^2}$$

21. Question Details

LarCalc9 2.2.049. [1197124]

Find the derivative of the function.

$$f(x) = \sqrt{x} - 8\sqrt[3]{x}$$

 $f'(x) =$

$$\frac{1}{2x^{\frac{1}{2}}} - \frac{1}{3} \cdot \frac{8}{x^{\frac{2}{3}}}$$

22. Question Details

LarCalc9 2.2.052. [1047648]

Find the derivative of the function.

$$f(t) = 4t^{2/3} - 2t^{1/3} + 4$$

 $f'(t) =$

$$\frac{8}{3}t^{-\frac{1}{3}} - \frac{2}{3}t^{-\frac{2}{3}}$$

23. Question Details

LarCalc9 2.2.054.MI. [1250728]

Find the derivative of the function.

$$f(x) = \frac{2}{\sqrt[3]{x}} + 7\cos x$$

f'(x) =

$$-\frac{2}{3x^{\frac{4}{3}}} - 7 \cdot \sin(x)$$

24. Question Details

LarCalc9 2.2.054.MI.SA. [1419775]

This question has several parts that must be completed sequentially. If you skip a part of the question, you will not receive any points for the skipped part, and you will not be able to come back to the skipped part.

Tutorial Exercise

Find the derivative of the function.


$$f(x) = \frac{7}{\sqrt[3]{x}} + 2\cos x$$

25. Question Details

LarCalc9 2.2.062.MI. [1196731]

Determine the point at which the graph of the function below has a horizontal tangent line. (If an answer does not exist, enter DNE.)

$$y = 8x^2 + 1$$

(x, y) = ( 0, 1)

26. Question Details

LarCalc9 2.2.062.MI.SA. [1420084]

This question has several parts that must be completed sequentially. If you skip a part of the question, you will not receive any points for the skipped part, and you will not be able to come back to the skipped part.

Tutorial Exercise

Determine the point at which the graph of the function below has a horizontal tangent line.

$$y = 4x^2 + 4$$

27. Question Details

LarCalc9 2.2.064. [1531272]

Determine the point(s) (if any) at which the graph of the function has a horizontal tangent line.

$$y = \sqrt{3}x + 2 \cos(x), 0 \leq x < 2\pi$$

STEP 1: Find a derivative y' .

$$\sqrt{3} - 2 \sin(x)$$

STEP 2: Set $y' = 0$ and solve for x .

$$x_1 = \frac{\pi}{3} \text{ (smaller } x\text{-value)}$$

$$x_2 = \frac{2\pi}{3} \text{ (larger } x\text{-value)}$$

STEP 3: Find the y values by substituting the values from Step 2 into the original function. y_1 corresponds to x_1 and y_2 corresponds to x_2 . List the points where the function has horizontal tangent lines. Submit your answers in terms of π for π .

$$(x_1, y_1) = \left(\frac{\pi}{3}, \frac{\sqrt{3}\pi + 3}{3} \right)$$

$$(x_2, y_2) = \left(\frac{2\pi}{3}, \frac{2\sqrt{3}\pi - 3}{3} \right)$$

28. Question Details

LarCalc9 2.2.068.MI. [1196717]

Find k such that the line is tangent to the graph of the function.

Function	Line
$f(x) = k\sqrt{x}$	$y = 4x + 4$

$$k = \text{ [input box] } 8$$

Assignment Details

Name (AID): **2.2Basic Differentiation Rules and Rates of Change (2047326)**

Submissions Allowed: **5**

Category: **Homework**

Code:

Locked: **Yes**

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