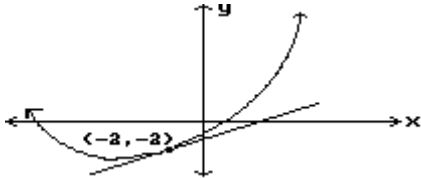


Estimate the slope of the curve at the indicated point.

1)



Find an equation for the tangent to the curve at the given point.

2) $y = \frac{x^3}{4}$, (6, 54)

3) $y = x^2 - 4$, (2, 0)

Find the slope of the curve at the indicated point.

4) $y = x^2 - 8x + 2$, $x = 1$

5) $y = \frac{4}{6 + x}$, $x = 5$

Solve the problem.

6) Find the points where the graph of the function have horizontal tangents.

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

7) Find equations of all tangents to the curve $f(x) = \frac{4}{x}$ that have slope -1.

8) Find an equation of the tangent to the curve $f(x) = 2x^2 - 2x + 1$ that has slope 2.

9) The equation for free fall at the surface of Planet X is $s = 8.43t^2$ m with t in seconds. Assume a rock is dropped from the top of a 600m cliff. Find the speed of the rock at $t = 3$ sec.

Calculate the derivative of the function. Then find the value of the derivative as specified.

10) $f(x) = 5x + 9$; $f'(2)$

11) $g(x) = x^3 + 5x$; $g'(1)$

12) $f(x) = \frac{8}{x}$; $f'(-1)$

Find the indicated derivative.

13) $\frac{dv}{dt}$ if $v = t + \frac{9}{t}$

Differentiate the function and find the slope of the tangent line at the given value of the independent variable.

14) $s = -5t^4 - 2t^3$, $t = -1$

Use the formula $f'(x) = \lim_{z \rightarrow x} \frac{f(z) - f(x)}{z - x}$ to find the derivative of the function.

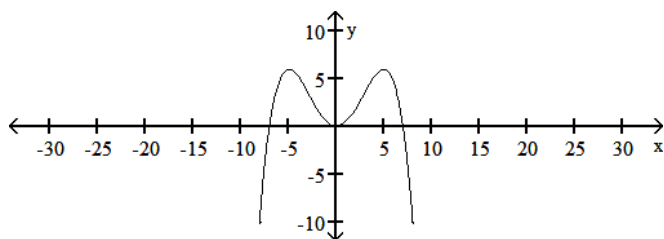
15) $f(x) = \frac{9}{x + 7}$

16) $f(x) = 5x^2 - 9x + 5$

17) $g(x) = 4x + \sqrt{x}$

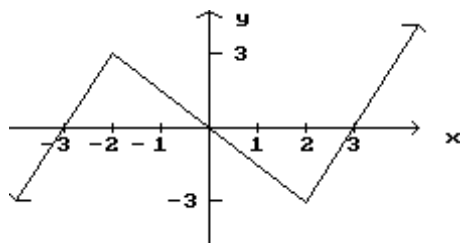
The graph of a function is given. Choose the answer that represents the graph of its derivative.

18)



Given the graph of f, find any values of x at which f' is not defined.

19)

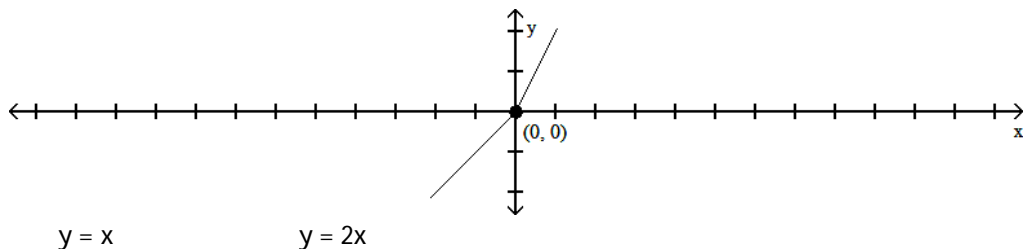


Determine if the piecewise defined function is differentiable at the origin.

20) $f(x) = \begin{cases} 4x - 5 & \text{if } x < 0 \\ x^2 + 5x + 5 & \text{if } x \geq 0 \end{cases}$

Compare the right-hand and left-hand derivatives to determine whether or not the function is differentiable at the point whose coordinates are given.

21)



Answer Key

Testname: PRACTICE05

1) $\frac{1}{2}$

2) $y = 27x - 108$

3) $y = 4x - 8$

4) $m = -6$

5) $m = -\frac{4}{121}$

6) $(-1, 1)$

7) $y = -x + 4$, $y = -x - 4$

8) $y = 2x - 1$

9) 50.58 m/sec

10) $f'(x) = 5$; $f'(2) = 5$

11) $g'(x) = 3x^2 + 5$; $g'(1) = 8$

12) $f'(x) = -\frac{8}{x^2}$; $f'(-1) = -8$

13) $1 - \frac{9}{t^2}$

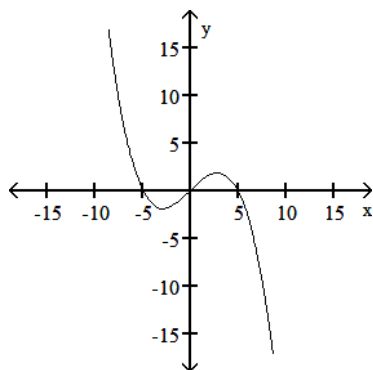
14) 14

15) $-\frac{9}{(x+7)^2}$

16) $10x - 9$

17) $4 + \frac{1}{2\sqrt{x}}$

18)



19) $x = -2, 2$

20) Not differentiable

21) Since $\lim_{x \rightarrow 0^+} f'(x) = 2$ while $\lim_{x \rightarrow 0^-} f'(x) = 1$, $f(x)$ is not differentiable at $x = 0$.