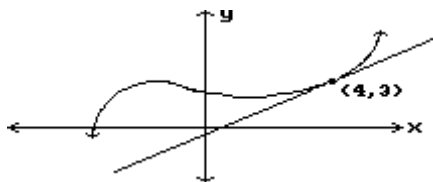


Practice 3: Derivative (Part 1)

Estimate the slope of the curve at the indicated point.

1)



- A) 0                      B) -1                      C) Undefined                      D) 1

1) \_\_\_\_\_

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

2)  $y = x^2 - 3, (2, 1)$

- A)  $y = 2x - 7$                       B)  $y = 4x - 11$                       C)  $y = 4x - 7$                       D)  $y = 4x - 14$

2) \_\_\_\_\_

Solve the problem.

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

- A)  $y = 2x + 2$                       B)  $y = 2x + 1$                       C)  $y = 2x$                       D)  $y = 2x - 1$

3) \_\_\_\_\_

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

$f(x) = 3x^2 + 3x + 5$

- A)  $\left(\frac{1}{2}, \frac{5}{2}\right)$                       B)  $(0, -5)$                       C)  $\left(-\frac{1}{2}, \frac{17}{4}\right)$                       D)  $(-1, 2)$

4) \_\_\_\_\_

5) For a motorcycle traveling at speed  $v$  (in mph) when the brakes are applied, the distance  $d$  (in feet) required to stop the motorcycle may be approximated by the formula  $d = 0.05v^2 + v$ . Find the instantaneous rate of change of distance with respect to velocity when the speed is 44 mph.

- A) 10.8 mph                      B) 5.4 mph                      C) 4.4 mph                      D) 45 mph

5) \_\_\_\_\_

6) A cubic salt crystal expands by accumulation on all sides. As it expands outward find the rate of change of its volume with respect to the length of an edge when the edge is 0.46 mm.

- A)  $63.48 \text{ mm}^3/\text{mm}$                       B)  $0.6348 \text{ mm}^3/\text{mm}$   
 C)  $0.29 \text{ mm}^3/\text{mm}$                       D)  $6.35 \text{ mm}^3/\text{mm}$

6) \_\_\_\_\_

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

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

- A)  $f'(x) = 5x; f'(2) = 10$                       B)  $f'(x) = 0; f'(2) = 0$   
 C)  $f'(x) = 5; f'(2) = 5$                       D)  $f'(x) = 9; f'(2) = 9$

7) \_\_\_\_\_

8)  $g(x) = 3x^2 - 4x; g'(3)$

- A)  $g'(x) = 2x - 4; g'(3) = 2$                       B)  $g'(x) = 6x - 4; g'(3) = 14$   
 C)  $g'(x) = 6x; g'(3) = 18$                       D)  $g'(x) = 3x - 4; g'(3) = 5$

8) \_\_\_\_\_

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

9) \_\_\_\_\_

A)  $f'(x) = -8x^2; f'(-1) = -8$

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

C)  $f'(x) = 8; f'(-1) = 8$

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

10)  $\frac{ds}{dt} \Big|_{t=2}$  if  $s = t^2 - t$

10) \_\_\_\_\_

A)  $\frac{ds}{dt} = 2t - 1; \frac{ds}{dt} \Big|_{t=2} = 3$

B)  $\frac{ds}{dt} = 2 - t; \frac{ds}{dt} \Big|_{t=2} = 0$

C)  $\frac{ds}{dt} = t - 1; \frac{ds}{dt} \Big|_{t=2} = 1$

D)  $\frac{ds}{dt} = 2t + 1; \frac{ds}{dt} \Big|_{t=2} = 5$

Find the indicated derivative.

11)  $\frac{dy}{dx}$  if  $y = 6x^3$

11) \_\_\_\_\_

A)  $18x^3$

B)  $18x$

C)  $18x^2$

D)  $3x^2$

12)  $\frac{dv}{dt}$  if  $v = t + \frac{5}{t}$

12) \_\_\_\_\_

A)  $t - \frac{5}{t^2}$

B)  $1 + \frac{5}{t^2}$

C)  $1 - \frac{5}{t^2}$

D)  $1 - \frac{5}{t}$

13)  $\frac{dp}{dq}$  if  $p = \frac{1}{\sqrt{q+9}}$

13) \_\_\_\_\_

A)  $-\frac{1}{(q+9)\sqrt{q+9}}$

B)  $\frac{1}{2(q+9)\sqrt{q+9}}$

C)  $-\frac{1}{2\sqrt{q+9}}$

D)  $-\frac{1}{2(q+9)\sqrt{q+9}}$

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

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

14) \_\_\_\_\_

A) 8

B) 32

C) -8

D) -32

Find an equation of the tangent line at the indicated point on the graph of the function.

15)  $y = f(x) = 4\sqrt{x} - x + 7$ , at  $(16, 7)$

15) \_\_\_\_\_

A)  $y = 7$

B)  $y = -\frac{1}{2}x + 15$

C)  $y = \frac{1}{2}x - 15$

D)  $y = -\frac{1}{2}x + 7$

16)  $y = f(x) = 4 + \sqrt{9-x}$ , at  $((8, 5))$

16) \_\_\_\_\_

A)  $y = -\frac{1}{2}x - 9$

B)  $y = \frac{1}{2}x + 9$

C)  $y = \frac{1}{2}x - 9$

D)  $y = -\frac{1}{2}x + 9$

Answer Key

Testname: CALC1PRACTICE\_3

- 1) D
- 2) C
- 3) D
- 4) C
- 5) B
- 6) B
- 7) C
- 8) B
- 9) D
- 10) A
- 11) C
- 12) C
- 13) D
- 14) C
- 15) B
- 16) D