

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

Find the derivative.

1) $f(x) = 7x^{-4}$, find $f'(2)$.

- A) -14 B) -3.5
C) -0.87 D) -1.75

2) $y = 6x^{-2} + 8x^3 + 11x$, find $f'(x)$

- A) $-12x^{-1} + 24x^2 + 11$
B) $-12x^{-1} + 24x^2$
C) $-12x^{-3} + 24x^2 + 11$
D) $-12x^{-3} + 24x^2$

Find the slope of the line tangent to the graph of the function at the given value of x.

3) $y = 9x^{5/2} - 7x^{3/2}$; $x = 4$

- A) 159 B) 6
C) 8 D) 96

Find all values of x (if any) where the tangent line to the graph of the function is horizontal.

5) $y = x^3 - 12x + 2$

- A) -2, 0, 2 B) 0
C) 0, 2 D) 2, -2

Give an appropriate answer.

7) If $g'(3) = 4$ and $h'(3) = -1$, find $f'(3)$ for $f(x) = 5g(x) + 3h(x) + 2$.

- A) 19 B) 17 C) 23 D) 25

Use the product rule to find the derivative.

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

- A) $f'(x) = 10x^4 - 36x^3 + 24x^2 + 4x - 16$
B) $f'(x) = 2x^4 - 32x^3 + 24x^2 + 4x - 16$
C) $f'(x) = 2x^4 - 36x^3 + 24x^2 + 4x - 16$
D) $f'(x) = 10x^4 - 32x^3 + 24x^2 + 4x - 16$

Use the quotient rule to find the derivative.

9) $g(t) = \frac{t^2}{t - 11}$

- A) $g'(t) = \frac{t^2}{(t - 11)^2}$ B) $g'(t) = \frac{22t}{(t - 11)^2}$
C) $g'(t) = \frac{t^2 + 22t}{(t - 11)^2}$ D) $g'(t) = \frac{t^2 - 22t}{(t - 11)^2}$

10) $g(x) = \frac{x^2 + 5}{x^2 + 6x}$

- A) $g'(x) = \frac{2x^3 - 5x^2 - 30x}{x^2(x + 6)^2}$
B) $g'(x) = \frac{6x^2 - 10x - 30}{x^2(x + 6)^2}$
C) $g'(x) = \frac{4x^3 + 18x^2 + 10x + 30}{x^2(x + 6)^2}$
D) $g'(x) = \frac{x^4 + 6x^3 + 5x^2 + 30x}{x^2(x + 6)^2}$

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

Provide an appropriate response.

12) If $g(-5) = 2$, $g'(-5) = -2$, $f(-5) = -3$, and $f'(-5) = -1$, what is the value of $h'(-5)$ where $h(x) = f(x)g(x)$? Show your work.

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

Find the derivative.

13) $y = \sqrt{4x + 2}$

A) $\frac{dy}{dx} = \frac{4}{\sqrt{4x + 2}}$

B) $\frac{dy}{dx} = \frac{8}{\sqrt{4x + 2}}$

C) $\frac{dy}{dx} = \frac{1}{\sqrt{4x + 2}}$

D) $\frac{dy}{dx} = \frac{2}{\sqrt{4x + 2}}$

14) $f(x) = (x^3 - 8)^{2/3}$

A) $f'(x) = \frac{2x}{3\sqrt{x^3 - 8}}$

B) $f'(x) = \frac{x}{3\sqrt{x^3 - 8}}$

C) $f'(x) = \frac{2x^2}{3\sqrt{x^3 - 8}}$

D) $f'(x) = \frac{x^2}{3\sqrt{x^3 - 8}}$

15) $f(x) = \frac{5}{(2x - 3)^4}$

A) $f'(x) = \frac{5}{4(2x - 3)^3}$

B) $f'(x) = \frac{-40}{(2x - 3)^5}$

C) $f'(x) = \frac{-40}{(2x - 3)^3}$

D) $f'(x) = \frac{5}{8(2x - 3)^5}$

The table lists the values of the functions f and g and their derivatives at several points. Use the table to find the indicated derivative.

	x	1	2	3	4
	f(x)	1	4	3	2
16)	f'(x)	3	-5	1	4
	g(x)	2	4	1	3
	g'(x)	1	6	-5	1

Find $D_x(f[g(x)])$ at $x = 3$.

A) 3
C) -5

B) -15
D) 1

Find all values of x for the given function where the tangent line is horizontal.

18) $f(x) = \sqrt{x^2 + 18x + 86}$

A) 0, -9

B) -9, 9

C) 0, 9

D) -9

Find dy/dx by implicit differentiation.

19) $2xy - y^2 = 1$

A) $\frac{x}{y - x}$

B) $\frac{x}{x - y}$

C) $\frac{y}{y - x}$

D) $\frac{y}{x - y}$

20) $y\sqrt{x + 1} = 4$

A) $\frac{2y}{x + 1}$

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

C) $-\frac{y}{2(x + 1)}$

D) $\frac{y}{2(x + 1)}$

Find the derivative.

$$23) y = \frac{\tan x}{2x - 3}$$

$$A) \frac{dy}{dx} = \frac{(2x - 3)\sec x \tan x - 2 \tan x}{(2x - 3)^2}$$

$$B) \frac{dy}{dx} = \frac{(2x - 3)\sec^2 x - 2 \tan x}{(2x - 3)^2}$$

$$C) \frac{dy}{dx} = \frac{\sec^2 x - 2 \tan x}{(2x - 3)^2}$$

$$D) \frac{dy}{dx} = \frac{(2x - 3)\csc^2 x - 2 \tan x}{(2x - 3)^2}$$

Find the derivative of the function.

$$24) y = \sec 8x$$

$$A) \frac{dy}{dx} = 8 \sec 8x \cot 8x$$

$$B) \frac{dy}{dx} = 8 \sec x \tan x$$

$$C) \frac{dy}{dx} = -\sec 8x \tan 8x$$

$$D) \frac{dy}{dx} = 8 \sec 8x \tan 8x$$

Find the slope of the line tangent to the curve at the given point.

$$25) y = 7 \cos x; x = \frac{\pi}{4}$$

$$A) -\frac{7}{2}$$

$$B) \frac{7\sqrt{3}}{2}$$

$$C) -\frac{7\sqrt{2}}{2}$$

$$D) \frac{7\sqrt{2}}{2}$$

Answer Key

Testname: UNIT 2 MULTIPLE CHOICE REVIEW

1) C

2) C

3) A

4) C

5) D

6) A

7) B

8) A

9) D

10) B

11) A

12) Product Rule:

$$h'(x) = f'(x)g(x) + f(x)g'(x)$$

$$h'(-5) = f'(-5)g(-5) + f(-5)g'(-5) = (-1)(2) + (-3)(-2)$$

$$h'(-5) = 4$$

13) D

14) C

15) B

16) B

17) B

18) D

19) C

20) C

21) A

22) B

23) B

24) D

25) C