MAC2311
Broward College Practice 08

Given $y = f(u)$ and $u = g(x)$, find $dy/dx = f'(g(x))g'(x)$.

1) $y = u^2$, $u = 4x - 5$ 1) _____

A) $16x - 20$ B) $32x - 40$ C) $32x$ D) $40x - 20$

2) $y = u(u - 1)$, $u = x^2 + x$ 2) _____

A) $2x^2 + 4x + 1$ B) $4x^3 + 6x^2 - 1$ C) $4x^3 + 6x^2 - 2x$ D) $2x^2 + 4x$

3) $y = \tan u$, $u = -13x + 17$ 3) _____

A) $\sec^2(-13x + 17)$ B) $-\sec^2(-13x + 17)$

C) $-13 \sec(-13x + 17) \tan(-13x + 17)$ D) $-13 \sec^2(-13x + 17)$

Write the function in the form $y = f(u)$ and $u = g(x)$. Then find dy/dx as a function of x.

4) $y = (2x + 8)^3$

5) $y = \cos^6 x$

Find the derivative of the function.

6) $y = x^5 \cos x - 6x \sin x - 6 \cos x$

7) $y = (1 + 7x)e^{-7x}$ 7) _____

A) $-49xe^{-7x}$ B) $7xe^{-7x}$ C) $-49e^{-7x}$ D) $-7(1 + 7x)e^{-7x}$

Find dy/dt.

8) $y = \cos^7(\pi t - 12)$ 8) _____

A) $7 \cos^6(\pi t - 12)$ B) $-7\pi \sin^6(\pi t - 12)$

C) $-7 \cos^6(\pi t - 12) \sin(\pi t - 12)$ D) $-7\pi \cos^6(\pi t - 12) \sin(\pi t - 12)$

9) $y = (1 + \sin 8t)^{-6}$ 9) _____

A) $-6(1 + \sin 8t)^{-7}$ B) $-48(\cos 8t)^{-7}$

C) $-48(1 + \sin 8t)^{-7} \cos 8t$ D) $-6(1 + \sin 8t)^{-7} \cos 8t$

10) $y = \cos(\sqrt{6t + 11})$ 10) _____

A) $-\sin(\sqrt{6t + 11})$ B) $\dfrac{3}{\sqrt{6t + 11}} \sin(\sqrt{6t + 11})$

C) $-\sin\left(\dfrac{3}{\sqrt{6t + 11}}\right)$ D) $-\dfrac{1}{2\sqrt{6t + 11}} \sin(\sqrt{6t + 11})$

Find y''.

11) $y = 6 \sin(2x + 12)$ 11) _____

A) $-24 \sin(2x + 12)$ B) $-24 \cos(2x + 12)$ C) $12 \cos(2x + 12)$ D) $-12 \sin(2x + 12)$

12) $y = -2x^5(4x + 5)^2$ 12) _____

A) $-1344x^5 - 2400x^4 - 1000x^3$ B) $-176x^6 - 480x^5 - 250x^4$

C) $-16x^6 - 80x^5 - 10x^4$ D) $-176x^5 - 800x^4 - 40x^3$

Find the value of $(f \circ g)'$ at the given value of x.

13) $f(u) = u^2$, $u = g(x) = x^5 + 2$, $x = 1$ 13) _____

A) -30 B) 30 C) 15 D) 6

14) $f(u) = \tan \frac{\pi u}{2}$, $u = g(x) = x^2$, $x = 6$ 14) _____

A) 6π B) -36π C) 12 D) -6π

Suppose that the functions f and g and their derivatives with respect to x have the following values at the given values of x. Find the derivative with respect to x of the given combination at the given value of x.

15) 15) _____

x	f(x)	g(x)	f ′(x)	g ′(x)
3	1	16	8	3
4	-3	3	5	-6

$f(g(x))$, $x = 4$

A) 24 B) 8 C) -30 D) -48

16) 16) _____

x	f(x)	g(x)	f ′(x)	g ′(x)
3	1	4	8	7
4	-3	3	2	-5

$\sqrt{f(x) + g(x)}$, $x = 3$

A) $-\frac{1}{2\sqrt{5}}$ B) $\frac{15}{\sqrt{5}}$ C) $\frac{15}{2\sqrt{5}}$ D) $\frac{1}{2\sqrt{5}}$

17) 17) _____

x	f(x)	g(x)	f ′(x)	g ′(x)
3	1	4	8	7
4	3	3	2	-6

$f^2(x) \cdot g(x)$, $x = 3$

A) 71 B) 112 C) 15 D) 39

Solve the problem.

18) The position of a particle moving along a coordinate line is $s = \sqrt{2 + 2t}$, with s in meters and t in seconds. Find the particle's velocity at t = 1 sec. 18) _____

A) 1 m/sec B) $-\frac{1}{2}$ m/sec C) $\frac{1}{2}$ m/sec D) $\frac{1}{4}$ m/sec

19) The position of a particle moving along a coordinate line is $s = \sqrt{5 + 4t}$ with s in meters and t in seconds. Find the particle's acceleration at t = 1 sec. 19) _____

A) $-\frac{1}{27}$ m/sec^2 B) $\frac{2}{3}$ m/sec^2 C) $\frac{4}{27}$ m/sec^2 D) $-\frac{4}{27}$ m/sec^2

Answer Key
Testname: PRACTICE08

1) B
2) B
3) D
4) $y = u^3; u = 2x + 8; \frac{dy}{dx} = 6(2x + 8)^2$
5) $y = u^6; u = \cos x; \frac{dy}{dx} = -6\cos^5 x \sin x$
6) $-x^5 \sin x + 5x^4 \cos x - 6x \cos x$
7) A
8) D
9) C
10) B
11) A
12) A
13) B
14) A
15) D
16) C
17) A
18) C
19) D