HW Quiz A 3.3-3.4 Name________________________________

Find dy/dx.

1) $y = 3x^4 + 2x^3 - 8$

A) $12x^3 + 6x^2 - 7$ B) $4x^3 + 3x^2 - 7$ C) $12x^3 + 6x^2$ D) $4x^3 + 3x^2$

Find the horizontal tangents of the curve.

2) $y = x^2 - 10x + 33$

$2x - 10 = 0$ at $x = 5$ → $y = 8$

Find dy/dx.

3) $y = (8x - 5)(2 - 6x^3)$

$\frac{dy}{dx} = (8x-5)(-18x^2) + (2-6x^3)(8)$

$= -144x^3 + 90x^2 + 16 - 48x^3$

$= -192x^3 + 90x^2 + 16$

$y = 16x - 48x^4 - 10 + 30x^3$

$y' = 16 - 192x^2 + 90x^2$

4) $y = \frac{x^2}{6 - 8x}$

$y' = \frac{(6-8x)(2x) - x^2(-8)}{(6-8x)^2} = \frac{12x - 16x^2 + 8x^2}{(6-8x)^2} = \frac{12x - 8x^2}{(6-8x)^2}$

Find the equation of the line tangent to the curve at the given value of x.

5) $y = 10x^2 + 9x$ at $x = 5$

$(5, 295)$ $y' = 20x + 9$

$y = 295 + 109(x - 5)$

Find dy/dx.

6) $y = 10x^{-2} + 8x^3 - 6x$

A) $-20x^{-1} + 24x^2 - 6$ B) $-20x^{-1} + 24x^2$ C) $-20x^{-3} + 24x^2$ D) $-20x^{-3} + 24x^2 - 6$

Find dy/dx

7) $y = x^3 \tan x$

$y' = x^3 \sec^2 x + \tan x(3x^2)$

8) $y = \dfrac{\sin x}{8x}$

$$y' = \frac{8x \cos x - \sin x(8)}{(64x^2)}$$

9) $y = x^7 - \csc x + 12$

A) $7x^6 + \csc x \cot x$ B) $x^6 - \cot^2 x + 12$ C) $7x^6 - \csc x \cot x$ D) $7x^6 + \cos^2 x$

10) $y = 15x \cos x - 15 \sec x$

$y' = 15x(-\sin x) + \cos x(15) - 15 \sec x \tan x$

HW Quiz A Chain Rule 18 Name________________________________

Find dy/dx.

1) $y = \sqrt{8 + \sin 2x}$ $= (8+\sin(2x))^{1/2}$

$y' = \frac{1}{2}(8+\sin(2x))^{-1/2} \cdot 2\cos 2x$ +3

$\boxed{y' = \cos 2x / \sqrt{8+\sin 2x}}$

2) $y = \cos^4 x - \sin 5x$

$y = -4\cos^3 x \sin x - 5\cos 5x$

+4

Change This 3) ~~$y = \sqrt{12x - x^5}$~~ $y = 6x(12x - x^5)^{1/2}$

$y' = 6x\left[\frac{1}{2}(12x-x^5)^{-1/2} \cdot (12-5x^4)\right] + 6\sqrt{12x-x^5}$

$\boxed{\frac{36x - 15x^5}{\sqrt{12x-x^5}} + 6\sqrt{12x-x^5}}$ +4

Change 4) $y = \frac{3x+2}{\sqrt{5-4x}}$ +4

$y' = 3\sqrt{5-4x} - (3x+2)\left[\frac{1}{2}(5-4x)^{-1/2} \cdot -4\right]$

$\boxed{y' = \frac{3\sqrt{5-4x} + \frac{6x+4}{\sqrt{5-4x}}}{5-4x}}$

$y = (3x+2)(5-4x)^{-1/2}$

$y' = (3x+2)\left[-\frac{1}{2}(5-4x)^{-3/2} \cdot -4\right] + 3(5-4x)^{-1/2}$

$\boxed{y' = 6x(5-4x)^{-3/2} + 3(5-4x)^{-1/2}}$

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

5)

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

a) **Find the derivative with respect to x of the given combination:** g(f(x))

$g' f(x) \cdot f'(x)$ +2

b) **Find the value of the derivative at x = 4.**

$g' f(4) \cdot f'(4)$

$g'(3) \cdot 5$ +1

$7 \cdot 5 = 35$

Find the derivative of the given function.

1) $y = 3\sin^{-1}(5x^4)$

$$y' = 3 \cdot \frac{1}{\sqrt{1-(5x^4)^2}} \cdot 20x^3 = \frac{60x^3}{\sqrt{1-(5x^4)^2}} = \frac{60x^3}{\sqrt{1-25x^8}}$$

2) $y = 3.1\cos^{-1}(2t)$

$$y' = \frac{-6.2}{\sqrt{1-4t^2}}$$

3) $y = \tan^{-1}\sqrt{5x}$ $\quad y = \arctan(5x)^{1/2}$

$$y' = \frac{1}{1+5x} \cdot \frac{1}{2}(5x)^{-1/2} \cdot 5 = \frac{5}{2\sqrt{5x}(1+5x)}$$

Find dy/dx.

4) $f(x) = 5e^{-8x}$

$$f'(x) = 5e^{-8x} \cdot \ln e \cdot -8 = -40e^{-8x}$$

5) $y = 8^x$

$$f'(x) = 8^x \cdot \ln 8$$

6) $y = \ln(8x^2)$

$$f'(x) = \frac{16x}{8x^2} = \frac{2}{x}$$

7) $y = \log(2x - 9)$

$$y' = \frac{2}{(2x-9)\ln 10}$$