Derivative Review Part 1

3.3,3.5,3.6,3.8,3.9

Find the derivative of the function

p. 181 #1

1) $y = x^5 - \dfrac{1}{8}x^2 + \dfrac{1}{4}x$

Find the derivative of the function

p. 181 #3

3) $y = 2\sin x \cos x$

Find the derivative of the function

3) $y = 2\sin x \cos x$

Find the derivative of the function

p. 181 #4

4) $\quad y = \dfrac{2x+1}{2x-1}$

Find the derivative of the function

p. 124 #4

2) $y = \dfrac{x^3}{3} - x$

Find the horizontal tangent to curve

p. 124 #7

7) $y = x^3 - 2x^2 + x + 1$

Find the derivative of the function

p. 124 #13

13) $y = (x+1)(x^2+1)$

Find the derivative of the function

p. 124 #13

13) $y = (x+1)(x^2+1)$

Find the derivative of the function

p. 124 #17

17) $y = \dfrac{2x+5}{3x-2}$

Find the derivative of the function

29) $y = 4x^{-2} - 8x + 1$

Find the derivative of the function

p. 124 #30

$$30) \quad y = \frac{x^{-4}}{4} - \frac{x^{-3}}{3} + \frac{x^{-2}}{2} - x^{-1} + 1$$

a) Find all points where f has horizontal tangents

p. 126 Quick Quiz 4

$$f(x) = x^4 - 4x^2$$

a) Find an equation of the tangent line at x = 1.

p. 126 Quick Quiz 4

$$f(x) = x^4 - 4x^2$$

b) Find an equation of the normal line at x = 1.

$$f(x) = x^4 - 4x^2$$

Find $\dfrac{dy}{dx}$

$$y = x \sec x$$

Find $\dfrac{dy}{dx}$

$$y = 3x + x\tan x$$

Find $\dfrac{dy}{dx}$

p. 146 8

$$y = \dfrac{x}{1+\cos x}$$

Find $\dfrac{dy}{dx}$

p. 146 8

$$y = \dfrac{x}{1+\cos x}$$

Find $\dfrac{dy}{dx}$

$$y = \sin^3 x \tan 4x$$

Find $\dfrac{dy}{dx}$

p. 153 19

$$y = \dfrac{3}{\sqrt{2x+1}}$$

Find $\dfrac{dy}{dx}$

$$y = \sin^2(3x - 2)$$

Find $\dfrac{dy}{dx}$

$$y = \sqrt{\tan 5x}$$

Find $\dfrac{dy}{dx}$

Extra Practice

$$y = \sqrt{\tan \sqrt{5x}}$$

Find the derivative of y with respect to the given variable

$$y = \sin^4(3x)$$

Find the derivative of y with respect to the given variable

$$y = \sin^{-1} \sqrt{2}t$$

Find the derivative of y with respect to the given variable

$$y = \sin^{-1} \sqrt{2t}$$

Find the derivative of y with respect to the given variable

p. 170 #21

$$y = \tan^{-1} \sqrt{x^2 - 1} + \csc^{-1} x$$

Find $\dfrac{dy}{dx}$

$$y = x^2 e^x - x e^x$$

Find $\dfrac{dy}{dx}$

p. 178 #13

$$y = 3^{\csc x}$$

Find $\dfrac{dy}{dx}$

$$y = \left(\ln x\right)^2$$

Find $\dfrac{dy}{dx}$

p. 178 #19

$y = \ln\left(\ln x\right)$

Find $\dfrac{dy}{dx}$

p. 178 #21

$$y = \log_4 x^2$$

Find the derivative of the function

p. 181 #8

$$y = x\sqrt{2x+1}$$

Find the derivative of the function

p. 181 #11

$$y = x^2 \csc x$$

Find the derivative of the function

p. 181 #17

$$y = \ln(\arccos x)$$

Find the derivative of the function

p. 181 #24

$$y = \arcsin\sqrt{1 - x^2}$$

Find the derivative of the function

p. 182 #30

$$y = \left(\frac{1 + \sin x}{1 - \cos x} \right)^2$$

Suppose that the functions f and g and their first derivatives have the following values at x = -1 and x =0 Find the first derivative of the following

$$\frac{d}{dx} f(g(x)) \text{ at } x = -1$$

x	f(x)	g(x)	$f'(x)$	$g'(x)$
-1	0	-1	2	1
0	-1	-3	-2	4

1. Let f be a differentiable function such that f(3) = 15, f(6) = 3, $f'(3) = -8$ and $f'(6) = -2$.

The function g is differentiable and g(x) = f⁻¹(x) for all x. What is the value of $g'(15)$?

a) -1/2   b) -1/8   c) 1/6   d) 1/3

e) The value of $g'(15)$ cannot be determined

4. If $f(2) = -3$, $f'(2) = \dfrac{4}{3}$, and $g(x) = f^{-1}(x)$,

what is the equation of the tangent line to g(x)

at x = -3?

A) $y\text{-}2 = \dfrac{-3}{4}(x+3)$

B) $y+2 = \dfrac{-3}{4}(x-3)$

C) $y\text{-}2 = \dfrac{3}{4}(x+3)$

D) $y+3 = \dfrac{3}{4}(x-2)$

E) $y\text{-}2 = \dfrac{4}{3}(x+3)$

Find the equation of the tangent and normal line to the curve at the given point

$$y = \frac{1}{x-1} \quad \text{at } x = 2$$

Find the equation of the tangent and normal line to the curve at the given point

$$y = x^2 - 3x - 1 \quad \text{at } x = 0$$

p. 182 #51

Find the equation for the line tangent to the curve at the given value of t

$$x = 3\sec t \quad y = 5\tan t \quad \text{at } t = \frac{\pi}{6}$$

Find the points at which the tangent line to the curve is horizontal and/or vertical

$$x = 2 - t \quad y = t^3 - 4t$$

1. A curve C is defined by the parametric equations $x = t^2 - 4t + 1$ and $y = t^3$. Find the equation of the line tangent to the graph of C at the point (1, 64)?

2. If $f(x) = (\ln x)^2$, then, $f''(e^2) =$

1. A curve C is defined by the parametric equations $x = t^2 - 4t + 1$ and $y = t^3$. Find the equation of the line tangent to the graph of C at the point (-2, 27)?

2.   Let h be a differentiable function, defined by f(x) = h(x³− 4).   Find $f'(3)$.