

1.(1 pt) Evaluate the limit

$$\lim_{x \rightarrow 0} \frac{\sin 3x}{6x}$$

2.(1 pt) Evaluate the limit

$$\lim_{x \rightarrow 0} \frac{\sin 5x}{\sin 4x}$$

3.(1 pt) Evaluate the limit

$$\lim_{x \rightarrow 0} \frac{\tan x}{4x}$$

4.(1 pt) If $f(x) = \cos x - 7 \tan x$, then
 $f'(x) =$

and $f'(4) =$

5.(1 pt) Let

$$f(x) = 4 \cos x + 3 \tan x$$

$f'(x) =$ _____

$f'(\frac{7\pi}{4}) =$ _____

6.(1 pt) If $f(x) = 7 \sin x + 2 \cos x$, then
 $f'(x) =$

and $f'(5)$.

7.(1 pt) Let

$$f(x) = 3 \sin x + 8 \cos x$$

$f'(x) =$ _____

$f'(\frac{7\pi}{4}) =$ _____

[Note: When entering trigonometric functions into Web-work, you must include parentheses around the argument. I.e. "sinx" would not be accepted but "sin(x)" would.]

8.(1 pt) If

$$f(x) = \frac{3 \sin x}{1 + \cos x}$$

find $f'(x)$.

Find $f'(4)$.

9.(1 pt) If $f(x) = \frac{5 \tan x}{x}$, find $f'(x)$.

Find $f'(5)$.

10.(1 pt) If

$$f(x) = \frac{\tan x - 2}{\sec x}$$

find $f'(x)$.

Find $f'(1)$.

11.(1 pt) Let

$$f(x) = \frac{-3 \tan x + 7}{\sec x}$$

$f'(x) =$

$f'(\frac{\pi}{4}) =$

12.(1 pt) If $f(x) = 3x(\sin x + \cos x)$, find $f'(x)$.

Find $f'(2)$.

13.(1 pt) Let

$$f(x) = 6x(\sin x + \cos x)$$

$f'(x) =$

$f'(\frac{\pi}{6}) =$

14.(1 pt) Let

$$f(x) = \frac{-7x}{\sin x + \cos x}$$

$f'(\pi) =$ _____

15.(1 pt) If $f(x) = 4x \sin x \cos x$, find $f'(x)$.

Find $f'(3)$.

16.(1 pt) Let

$$f(x) = 6x \sin x \cos x$$

$f'(\frac{3\pi}{2}) =$ _____

17.(1 pt) If $f(x) = \frac{3x^2 \tan x}{\sec x}$, find $f'(x)$.

Find $f'(4)$.

18.(1 pt)

Find the equation of the tangent line to the curve $y = 4 \sin x$ at the point $(\pi/6, 2)$.

The equation of this tangent line can be written in the form $y = mx + b$ where

$m =$ _____

and $b =$ _____

19.(1 pt) Find the equation of the tangent line to the curve $y = 2 \tan x$ at the point $(\pi/4, 2)$. The equation of this tangent line can be written in the form $y = mx + b$ where m is: _____ and where b is: _____

20.(1 pt) Find the equation of the tangent line to the curve $y = 2 \sec x - 4 \cos x$ at the point $(\pi/3, 2)$. The equation of this tangent line can be written in the form $y = mx + b$ where m is:

and where b is: _____

21.(1 pt)

Find the equation of the tangent line to the curve $y = 3x \cos x$ at the point $(\pi, -3\pi)$.

The equation of this tangent line can be written in the form $y = mx + b$ where

$m =$ _____

and $b =$ _____

22.(1 pt) Match the functions and their derivatives:

— 1. $y = \sin(x) \tan(x)$

— 2. $y = \cos^3(x)$

— 3. $y = \cos(\tan(x))$

— 4. $y = \tan(x)$

A. $y' = -\sin(\tan(x)) / \cos^2(x)$

B. $y' = \sin(x) + \tan(x) \sec(x)$

C. $y' = -3 \cos^3(x) \tan(x)$

D. $y' = 1 + \tan^2(x)$

23.(1 pt) Find the 83rd derivative of $\sin(x)$ at $x = 3$ by finding the first few derivatives and observing the pattern that occurs. _____

24.(1 pt) Let $h(t) = \tan(4t + 3)$. Then $h'(3)$ is _____ and $h''(3)$ is _____