1. (1 pt) Let

$$f(x) = \sqrt{2x^2+4x+4}$$

$f'(x) =$ _____
$f'(5) =$ _____

Answer(s) submitted:

- `(x+1) / ((sqrt((x^2/2) + x + 1)))`
- `6sqrt(2/37)`

(correct)

2. (1 pt) Let $f(x) = (5x+6)^{-1}$.

$f'(x) =$ _____
$f'(3) =$ _____

Answer(s) submitted:

- `(-5) / ((5x+6)^2)`
- `-(5/441)`

(correct)

3. (1 pt) Let

$$y = \sqrt{6-2\tan x}$$

$\frac{dy}{dx} =$ _____

Answer(s) submitted:

-

(incorrect)

4. (1 pt) Let $f(x) = 2\sin(2x-2)$. Find $f'(x)$.
$f'(x) =$ _____
Answer(s) submitted:

-

(incorrect)

5. (1 pt) Let $f(x) = 7\sin^2 x$.

$f'(x) =$ _____
Answer(s) submitted:

-

(incorrect)

6. (1 pt) Match the functions and their derivatives:

___1. $y = \cos^3(x)$
___2. $y = \cos(\tan(x))$
___3. $y = \tan(x)$
___4. $y = \sin(x)\tan(x)$

A. $y' = -3\cos^3(x)\tan(x)$
B. $y' = \sin(x) + \tan(x)\sec(x)$
C. $y' = 1 + \tan^2(x)$
D. $y' = -\sin(\tan(x))/\cos^2(x)$

Answer(s) submitted:

-
-
-
-

(incorrect)

7. (1 pt) Let

$$f(x) = 4\csc(2x)$$

$f'(x) =$ _____

Answer(s) submitted:

- `-8cot(2x)csc(2x)`

(correct)

8. (1 pt) Let

$$f(x) = (-4x^2+3)^4(6x^2+6)^{12}$$

$f'(x) =$ _____

Answer(s) submitted:

- `17414258688x(x^2+1)^11 (4x^2 - 3)^3 (16x^2 - 5)`

(correct)

9. (1 pt) Let

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

$f'(x) =$ _____

Answer(s) submitted:

- `-8sin(sin(x))cos(x)`

(correct)

10. (1 pt) If $f(t) = (6t - \frac{6}{t})^{\frac{2}{9}}$, find $f'(t)$.

_____

Answer(s) submitted:

- `(2((6/t^2)+6))/(9(6t - (6/t))^(7/9))`

(correct)

11. (1 pt) Let

$$f(x) = \frac{9x}{\sqrt{9-2x}}$$

$f'(x) =$ _____

Answer(s) submitted:

- `-(9(x-9)) / ((9-2x)^(3/2))`

(correct)

12. (1 pt) Let

$$y = (5+\cos^2 x)^6$$

$\frac{dy}{dx} =$ _____

Answer(s) submitted:

- `-12sin(x)cos(x)((cos^2(x) + 5)^5)`

(correct)

13. (1 pt) Find an equation of the tangent line to the curve

$$y = \sin(7x) + \cos(6x)$$

at the point $(\frac{\pi}{6}, y(\frac{\pi}{6}))$. Tangent line:

$y =$ _____

Answer(s) submitted:

- `((-7xsqrt(3))/2) + ((7 pi)/(4sqrt(3))) - (3/2)`

(correct)

14. (1 pt) Let $f(x) = 4x^2\cos(6x)$.
Then $f'(x)$ is _____
and $f'(3)$ is _____
$f''(x)$ is _____
and $f''(3)$ is _____

Answer(s) submitted:

- `8x(cos(6x) - 3xsin(6x))`
- `24(cos(18)-9sin(18))`
- `8((1-18x^2)cos(6x) - 12xsin(6x))`
- `-8(36sin(18) + 161cos(18))`

(correct)

15. (1 pt) A table of values for f, g, f', and g' is given below.

x	f(x)	g(x)	f ' (x)	g' (x)
1	3	2	2	1
2	1	2	2	2
3	1	2	3	3

(A) If $h(x) = f(g(x))$, then $h'(1)$ = _____
(B) If $H(x) = g(f(x))$, then $H'(2)$ = _____

Answer(s) submitted:

- `2`
- `2`

(correct)

16. (1 pt) Suppose that

$$f(x) = \frac{5x}{(1-4x)^4}.$$

Find an equation for the tangent line to the graph of f at $x = 2$.
Tangent line: $y =$ _____

Answer(s) submitted:

- `(320/16807) - (125x/16807)`

(correct)

17. (1 pt) A Cepheid variable star is a star whose brightness alternately increases and decreases. Suppose that Cephei Joe is a star for which the interval between times of maximum brightness is 4.6 days. Its average brightness is 4.1 and the brightness changes by +/-0.65. Using this data, we can construct a mathematical model for the brightness of Cephei Joe at time t, where t is measured in days:

$$B(t) = 4.1 + 0.65\sin(2\pi t/4.6)$$

(a) Find the rate of change of the brightness after t days.
Rate of change = _____
(b) Find, correct to two decimal places, the rate of increase after one day.
Rate of increase = _____

Answer(s) submitted:

- `0.888cos(1.36591t)`
- `0.18`

(score 0.5)

18. (1 pt) Find the 20 th derivative of $y = \cos(3x)$.
Answer: _____

Answer(s) submitted:

- `3486784401cos(3x)`

(correct)