Problem 1. 20. (1 pt) Let

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

$f'(x) =$ _____

Answer(s) submitted:

- `6sin(x)sin(cos(x))`

(correct)
Correct Answers:

- `6*sin(cos(x))*sin(x)`

Problem 2. 24. (1 pt) If $f(x) = 4 + \frac{2}{x} + \frac{4}{x^2}$, find $f'(x)$.

_____

Answer(s) submitted:

- `-((2(x+4))/(x^3))`

(correct)
Correct Answers:

- `-2*x**(-2) -2*4*x**(-3)`

Problem 3. 10. (1 pt) If $f(t) = (2t - \frac{3}{t})^{\frac{8}{7}}$, find $f'(t)$.

_____

Answer(s) submitted:

- `(8/7)((3/(t^2))+2)((2t-(3/t))^(1/7))`

(correct)
Correct Answers:

- `8/7*(2*t-3/t)**(8/7-1)*(2+3/(t**2))`

Problem 4. 29. (1 pt) Find the first and second derivative of the function.

$$f(x) = 2\sin x + 10\cos x.$$

$f'(x) =$ _____

$f''(x) =$ _____

Answer(s) submitted:

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

(correct)
Correct Answers:

- `2*cos(x) - 10*sin(x)`
- `-2*sin(x) - 10*cos(x)`

Problem 5. 9. (1 pt) Differentiate

$$f(x) = \tan x(6\sin x + 2\cos x).$$

$f'(x) =$ _____

Answer(s) submitted:

- `2((3tan(x)+1)sec(x)-sin(x)(tan(x) - 3))`

(correct)
Correct Answers:

- `(sec(x))^{2}*(6*sin(x) + 2*cos(x)) + tan(x)*(6*cos(x) - 2*`

Problem 6. 5. (1 pt) If $f(x) = 5\sqrt{x}(x-4)$, find $f'(x)$.
$f'(x) =$ _____

Answer(s) submitted:

- `(5(3x-4))/(2sqrt(x))`

(correct)
Correct Answers:

- `(5)*(3/2)*(x**(1/2)) - (5)*(4/2)*(x**(-1/2))`

Problem 7. 2. (1 pt) If $f(t) = 6t^{-2/6}$, find $f'(t)$.
$f'(t) =$ _____

Answer(s) submitted:

- `(2/(t^(4/3)))`

(incorrect)
Correct Answers:

- `(-2)*(t**((-2/6)-1))`

Problem 8. 7. (1 pt) Let $f(x) = (5x - 8x^3)(2 + \sqrt{x})$. Find $f'(x)$.
$f'(x) =$ _____

Answer(s) submitted:

-

(incorrect)
Correct Answers:

- `(5-3*8*(x)**2)*(2+sqrt(x))+(5*x -8*x**3)*(1/(2*sqrt(x)))`

Problem 9. 8. (1 pt) Find the derivative of $f(x) = x^7 \cos x$
$f'(x) =$ _____
SOLUTION:

SOLUTION
Using the product rule,

$$f'(x) = 7x^6 \cos(x) - x^7 \sin(x)$$

Answer(s) submitted:

- `(-28(x^(5/2)))-(48(x^2))+((15sqrt(x))/(2))+(10)`

(incorrect)
Correct Answers:

- `7*x^(7-1)*cos(x) - x^(7)*sin(x)`

Problem 10. 3. (1 pt) If $f(t) = 2\sqrt{t} + \frac{8}{\sqrt{t}}$, find $f'(t)$.
$f'(t) =$ _____

Answer(s) submitted:

- `((t-4)/(t^(3/2)))`

(correct)
Correct Answers:

- `(2/2)*(t**(-1/2)) - (1/2)*(8)*(t**(-3/2))`

Problem 11. 25. (1 pt) If $f(x) = \frac{2x^5+4x^4+2x^3}{x^4}$, find $f'(x)$.

_____

Answer(s) submitted:

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

(correct)
Correct Answers:

- `2 - 2/x^2`

Problem 12. 1. (1 pt)
Differentiate the following function:

$$V(r) = \frac{4}{3}\pi r^3$$

$V'(r) =$ _____
Answer(s) submitted:

- `4 (pi) (r^2)`

(correct)
Correct Answers:

- `(4* pi* r^2)`

Problem 13. 22. (1 pt)

Let $f(x) = \frac{6}{5x+2}$.

$f'(x) =$ _____

Answer(s) submitted:

- `(30)/((5x+2)^2)`

(incorrect)
Correct Answers:

- `-6*5/(5*x +2)**2`

Problem 14. 23. (1 pt)

Let $f(x) = -3x^5\sqrt{x} + \frac{-3}{x^2\sqrt{x}}$.

$f'(x) =$ _____

[NOTE: Your answer should be a function in terms of the variable 'x' and not a number!]

Answer(s) submitted:

- `-((3(11(x^8) - 5))/((2x^(7/2))))`

(correct)
Correct Answers:

- `-3*(5 + 1/2)*x**(5 - 1/2) - -3*(2 + 1/2)/x**(2+3/2)`

Problem 15. 12. (1 pt) Let

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

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

Answer(s) submitted:

- `((5(sec(x))^2)/(2sqrt(5-5tan(x))))`

(incorrect)
Correct Answers:

- `-5/2*(sec(x))^2*(5+-5*tan(x))^(-.5)`

Problem 16. 15. (1 pt) Let

$$f(x) = (8x^2 - 2)^6(2x^2 - 4)^{13}$$

$f'(x) =$ _____

Answer(s) submitted:

- `(1048576x)(((x^2)-2)^12)((4(x^2) - 1)^5)(76(x^2) - 61)`

(correct)
Correct Answers:

- `(8*x^2+-2)^5 * (2*x^2+-4)^12 * (608*x^3 + -488*x)`

Problem 17. 21. (1 pt) If $f(x) = 3x^2 - 11x - 12$, find $f'(x)$.

_____

Answer(s) submitted:

- `6x - 11`

(correct)
Correct Answers:

- `2*3*x-11`

Problem 18. 11. (1 pt) Let

$$f(x) = \frac{-5x}{\sqrt{5-5x}}$$

$f'(x) =$ _____

Answer(s) submitted:

- `((sqrt(5))(x-2))/(2(1-x)^(3/2))`

(correct)
Correct Answers:

- `(-5*(5-5*x)+-5*5*x/2)/(5-5*x)**(3/2)`

Problem 19. 17. (1 pt) If $f(x) = \cos x - 3\tan x$, then $f'(x) =$ _____

Answer(s) submitted:

- `-sin(x) - 3(sec(x))^2`

(correct)
Correct Answers:

- `-sin(x)-3*(sec(x))^2`

Problem 20. 4. (1 pt) If $f(x) = \frac{2x^2+5x+33}{\sqrt{x}}$, find $f'(x)$.
$f'(x) =$ _____

Answer(s) submitted:

- `((6x^2)+(5x)-(33))/(2(x)^(3/2))`

(correct)
Correct Answers:

- `(2)*(3/2)*(x**(1/2)) + (5/2)*(x**(-1/2)) -(33/2)*(x**(-3/2))`

Problem 21. 13. (1 pt) Let

$$y = (1+\cos^2 x)^{14}$$

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

Answer(s) submitted:

- `-28sin(x)cos(x)(((cos(x))^2) + 1)^13)`

(incorrect)
Correct Answers:

- `-2*cos(x)*sin(x)*14*(1+(cos(x))^2)^(14-1)`

Problem 22. 19. (1 pt) Let

$$f(x) = 4\csc(7x)$$

$f'(x) =$ _____

Answer(s) submitted:

- `-28cot(7x)csc(7x)`

(correct)
Correct Answers:

- `-4*7/(tan(7*x)*sin(7*x))`

Problem 23. 27. (1 pt) If $f(u) = \sqrt{7}\,u + \sqrt{8u}$, find $f'(u)$

_____

Answer(s) submitted:

- `((sqrt(2))/(sqrt(u)))+(sqrt(7))`

(correct)
Correct Answers:

- `sqrt(7)+sqrt(8)/(2*sqrt(u))`

Problem 24. 26. (1 pt) If $y = 3\pi^3$, find y'.

_____

Answer(s) submitted:

- `0`

(correct)
Correct Answers:

- `0`

Problem 25. 18. (1 pt) Let $f(x) = 6\sin(6x+9)$. Find $f'(x)$.
$f'(x) =$ _____
Answer(s) submitted:

- `36cos(6x+9)`

(correct)
Correct Answers:

- `6*6*cos(6*x+9)`

Problem 26. 28. (1 pt) If $f(t) = 5\sin t - 3\pi\cos t$, find $f'(t)$

_____

Answer(s) submitted:

- `((3 pi)sin(t))+(5cos(t))`

(correct)
Correct Answers:

- `5*cos(t) +3*3.14159265358979*sin(t)`

Problem 27. 30. (1 pt) If $f(t) = \dfrac{\sin t}{5} + \dfrac{5}{t}$, then

$f'(t) =$ _____

Answer(s) submitted:

- `(((cos(t))/(5))-((5)/(t^2)))`

(correct)
Correct Answers:

- `cos(t)/5-5/t^2`

Problem 28. 6. (1 pt) If $f(t) = \sqrt[3]{t^2} + 2\sqrt{t^3}$, find $f'(t)$.
$f'(t)$ = _____

Answer(s) submitted:

-

(incorrect)
Correct Answers:

- `(2/3)*(t^(-1/3)) + (3)*(t**(1/2))`

Problem 29. 32. (1 pt) Find dy/dx by implicit differentation:

$$7 + 4x = \sin(xy^2)$$

Answer(s) submitted:

- `-(((y^2)-(4sec(x(y^2))))/(2xy))`

(correct)
Correct Answers:

- `y*(y**(-2)*4-cos(x*y**2))/(2*x*cos(x*y**2))`

Problem 30. 14. (1 pt) If $f(t) = (t^2 + 6t + 2)(4t^{-2} + 6t^{-3})$, find $f'(t)$.

Answer: _____

Answer(s) submitted:

- `-(((30t^2)+(88t)+(36))/(t^4))`

(correct)
Correct Answers:

- `(2*t+6)*(4*t^(-2) +6*t^(-3)) + (t^2 + 6*t+2)*(-2*4*t^(-3)-`

Problem 31. 16. (1 pt) Let $f(x) = 5\cos^3 x$.

$f'(x) =$ _____

Answer(s) submitted:

- `-15sin(x)(cos(x))^2`

(correct)
Correct Answers:

- `- 5*3*(cos(x))^(3 - 1)*sin(x)`

Problem 32. 31. (1 pt) If $f(x) = (x-3)(7x+9)$, then

$f'(x) =$ _____

Answer(s) submitted:

- `2(7x-6)`

(correct)
Correct Answers:

- `2*7*x +9 -3*7`