

## PRACTICE PROBLEMS

1.  $y = 3 \cot(7x)$
2.  $y = \sin(3) \cos(8x)$
3.  $y = e^{2x}(x^5 + 4)^9$
4.  $y = \ln(11)$
5.  $y = -4 \tan(x^2)$
6.  $y = \tan(e^x)$
7.  $y = x^x$
8.  $y = \ln(\sin(x))$
9.  $y = -x^{-9/10} - x^{-7/10} - x^{-5/10}$
10.  $y = e^{x^2}$
11.  $y = 478 \sin^{-1}\left(\frac{x}{9}\right)$
12.  $y = \cos^{48}(x)$
13.  $y = 8x^5 + 13x^{-5}$
14.  $y = \sin(x^3 + x^4)$
15.  $y = 4^{-x}$
16.  $y = -4\sqrt{x^6 + x^4 + 2}$
17.  $y = \sqrt[5]{11x + 8}$
18.  $y = \cos(\ln(x^5))$
19.  $y = \tan^{-1}(5x)$
20.  $y = \sec(3x) + \cos(5x)$
21.  $y = \frac{x^8 + 1}{e^x \sin(x)}$
22.  $8x^2y + 8xy^2 = -y \cos(2x)$
23.  $y = 15 \csc(2x)$
24.  $y = e^x \ln(x^2)$
25.  $y^3 = x^3$
26.  $y = \frac{\tan(x)}{x^2 + 22}$

## SOLUTIONS

Solutions are left un-simplified.

1.  $\frac{dy}{dx} = -3 \csc^2(7x)(7)$
2.  $\frac{dy}{dx} = -\sin(3) \sin(8x)(8)$
3.  $\frac{dy}{dx} = e^{2x}(2)(x^5 + 4)^9 + e^{2x}(9)(x^5 + 4)^8(5x^4)$
4.  $\frac{dy}{dx} = 0$
5.  $\frac{dy}{dx} = -4 \sec^2(x^2)(2x)$
6.  $\frac{dy}{dx} = \sec^2(e^x)e^x$
7.  $\frac{dy}{dx} = x^x(\ln(x) + 1)$
8.  $\frac{dy}{dx} = \frac{1}{\sin(x)} \cos x$
9.  $\frac{dy}{dx} = \frac{9}{10}x^{-19/10} + \frac{7}{10}x^{-17/10} + \frac{5}{10}x^{-15/10}$
10.  $\frac{dy}{dx} = e^{x^2}(2x)$
11.  $\frac{dy}{dx} = \frac{478}{\sqrt{1 - (\frac{x}{9})^2}} \left(\frac{1}{9}\right)$
12.  $\frac{dy}{dx} = -48 \cos^{47}(x) \sin(x)$
13.  $\frac{dy}{dx} = 8(5)x^4 + 13(-5)x^{-6}$
14.  $\frac{dy}{dx} = \cos(x^3 + x^4)(3x^2 + 4x^3)$
15.  $\frac{dy}{dx} = -(4^{-x})\ln(4)$
16.  $\frac{dy}{dx} = -\frac{1}{2}(4)(x^6 + x^4 + 2)^{-1/2}(6x^5 + 4x^3)$
17.  $\frac{dy}{dx} = \frac{1}{5}(11x + 8)^{-4/5}(11)$
18.  $\frac{dy}{dx} = -\sin(\ln(x^5)) \left(\frac{1}{x^5}\right) (5x^4)$
19.  $\frac{dy}{dx} = \frac{5}{1 + (5x)^2}$
20.  $\frac{dy}{dx} = \sec(3x)\tan(3x)(3) - \sin(5x)(5)$
21.  $\frac{dy}{dx} = \frac{8x^7(e^x \sin(x)) - (x^8 + 1)(e^x \sin(x) + e^x(\cos(x)))}{(e^x \sin(x))^2}$
22.  $\frac{dy}{dx} = \frac{y \sin(2x)(2) - 8y^2 - 16xy}{8x^2 + 16xy + \cos(2x)}$
23.  $\frac{dy}{dx} = -15 \csc(2x) \cot(2x)(2)$
24.  $\frac{dy}{dx} = e^x \ln(x^2) + \frac{e^x}{x^2}(2x)$
25.  $\frac{dy}{dx} = \frac{3x^2}{3y^2}$
26.  $\frac{dy}{dx} = \frac{\sec^2(x)(x^2 + 22) - \tan(x)(2x)}{(x^2 + 22)^2}$