

**Answers:** Absolutely not simplified ... you should simplify more.

1.  $f'(x) = 20x^4 - 20x^3$
2.  $f'(x) = e^x \cos x + (\sin x)e^x$
3.  $f'(x) = -1(x^4 + 3x)^{-2}(4x^3 + 3)$
4.  $f'(x) = 3x^2 \cdot 7(x^3 + 1)^6(3x^2) + (x^3 + 1)^7 \cdot 6x$
5.  $f'(x) = 4(\cos x)^3(-\sin x) - 4x$
6.  $f'(x) = \frac{(1+x^2)(1) - x(2x)}{(1+x^2)^2}$
7.  $f'(x) = 1 + x^{-2}$  (*Simplify f first.*)
8.  $f'(x) = 3 \cdot \frac{5}{2} x^{\frac{3}{2}}$  (*Simplify f first.*)
9.  $f'(x) = \frac{1}{x} + 7$  (*Simplify f first.*)
10.  $f'(x) = 4x + 0 + 2x^{-3}$  (*Simplify f first.*)
11.  $f'(x) = x^3 \cdot \frac{1}{5}(2-x)^{-\frac{4}{5}}(-1) + (2-x)^{\frac{1}{5}}(3x^2)$
12.  $f'(x) = 2 + 2x^{-\frac{3}{2}}$
13.  $f'(x) = \frac{(x^2 + 7x)[4 \cdot 2(3x - 1)(3)] - 4(3x - 1)^2(2x + 7x \ln 7)}{(x^2 + 7x)^2}$
14.  $f'(x) = \frac{1}{2}(x^2 + 8)^{-\frac{1}{2}}(2x)$
15.  $f'(x) = \frac{(1 - (\ln x)^2)^{\frac{1}{2}}(1 - x \cdot \frac{1}{2}(1 - (\ln x)^2)^{-\frac{1}{2}}(-2(\ln x) \cdot \frac{1}{x}))}{1 - (\ln x)^2}$
16.  $f'(x) = -24(3x^2 - \pi)^{-5}(6x)$
17.  $f'(x) = \frac{1}{6}[4(3x^2 - \pi x)^3(6x - \pi)]$
18.  $f'(x) = \frac{(x^2 + \sqrt{3x})^5(1) - x[5(x^2 + \sqrt{3x})^4(2x + \frac{1}{2}(3x)^{-\frac{1}{2}} \cdot 3)]}{(x^2 + \sqrt{3x})^{10}}$
19.  $f'(x) = \pi(xe^x)^{(\pi-1)}[xe^x + e^x]$
20.  $f'(x) = 10[\arctan(2x)]^9 \cdot \frac{1}{1 + (2x)^2} \cdot 2$
21.  $f'(x) = \frac{1}{2}(e^{2x} + e)^{-\frac{1}{2}}(e^{2x} \cdot 2 + 0)$
22.  $f'(x) = (x^6 + 1)^5[3(4x + 7)^2(4)] + (4x + 7)^3[5(x^6 + 1)^4(6x^5)]$
23.  $f'(x) = 6(7x + \sqrt{x^2 + 3})^5(7 + \frac{1}{2}(x^2 + 3)^{-\frac{1}{2}} \cdot 2x)$
24.  $f'(x) = \frac{(x-1)(-x^{-2} - 2x^{-3}) - (x^{-1} + x^{-2})(1)}{(x-1)^2}$
25.  $f'(x) = \frac{2}{3}x^{-\frac{1}{3}} + \frac{3}{2}x^{-\frac{5}{2}}$
26.  $f'(x) = \frac{1}{2}\left(\frac{2x+5}{7x-9}\right)^{-\frac{1}{2}} \left[\frac{(7x-9)(2) - (2x+5)(7)}{(7x-9)^2}\right]$
27.  $f'(x) = \sec^2 x$
28.  $f'(x) = [e^x(x^2 + 3)](3x^2) + (x^3 + 4)[e^x(2x) + (x^2 + 3)e^x]$
29.  $f'(x) = \frac{(x^2 + 2)(10x - 7) - (5x^2 - 7x)(2x)}{(x^2 + 2)^2}$
30.  $f'(x) = 3[\ln(5x^2 + 9)]^2 \cdot \frac{1}{5x^2 + 9}(10x + 0)$
31.  $f'(x) = \frac{1}{(5x^2 + 9)^3} \cdot [3(5x^2 + 9)^2(10x + 0)]$
32.  $f'(x) = -\csc^2(6x) \cdot 6$
33.  $f'(x) = \sec^2 x(\sec^2 x) + \tan x[2 \cdot \sec x(\sec x \tan x)]$
34.  $f'(x) = \frac{1}{\sqrt{1 - (2x)^2}} \cdot 2^x \ln 2$
35.  $f'(x) = (\sec^2(\cos x))(-\sin x)$
36.  $f'(x) = 3[(x^2 - 1)^5 - x]^2(5(x^2 - 1)^4 \cdot 2x - 1)$
37.  $f'(x) = \sec x(\cos(3x) \cdot 3) + \sin(3x)(\sec x \tan x)$
38.  $f'(x) = \frac{x(x+3)^4[3(x-1)^2(1)] - (x-1)^3[x \cdot 4(x+3)^3(1) + (x+3)^4(1)]}{x^2(x+3)^8}$
39.  $f'(x) = \frac{1}{(3x^2 + 4x) \cdot \ln 5} \cdot (6x + 4)$
40.  $\frac{dy}{dx} = \frac{e^{5y}}{3 - 5xe^{5y}}$
41.  $\frac{dy}{dx} = \frac{-3x^2 - y}{x + 2y}$
42.  $\frac{dy}{dx} = \frac{3(y^2 + 1)^2}{(y^2 + 1)(\cos y) - 2y \sin y}$