

## ANSWERS

1.  $y' = \cos x - 3 \sec x \tan x - 5 \csc^2 x$

2.  $y' = -6x^2 \sin(2x^3)$

3.  $y' = 5x^4 \csc x - x^5 \csc x \cot x$

4.  $y' = 5(\csc^4 x)(-\csc x \cot x)$

5.  $y' = -5x^4 \csc(x^5) \cot(x^5)$

6.  $y' = \frac{(x^3 - \sin x)(1 + \sec^2 x) - (x + \tan x)(3x^2 - \cos x)}{(x^3 - \sin x)^2}$

7.  $y' = (-1 - 4x^{-2}) \tan(x^2 + 1) + (3 - x + \frac{4}{x})(\sec^2(x^2 + 1))(2x)$

8.  $y' = \frac{1}{2} \left( \frac{\sin(2x+1)}{\cos(3-2x^2)} \right)^{-1/2} \left( \frac{[\cos(3-2x^2)(\cos(2x+1))(2)] - [\sin(2x+1)(-\sin(3-2x^2))(-4x)]}{\cos^2(3-2x^2)} \right)$

9.  $y' = 50 \left( \frac{\sin x}{x^3 \cot(1/x)} \right)^{49} \left( \frac{[x^3 \cot(1/x) \cos x] - \sin x [3x^2 \cot(1/x) + x^3 (-\csc^2(1/x))(-x^{-2})]}{(x^3 \cot(1/x))^2} \right)$

10.  $y' = \cos(\cos(x^3))(-\sin(x^3))(3x^2) = -3x^2 \sin(x^3) \cos(\cos(x^3))$

11.  $y' = 3x^2 \sin x \cos x + x^3 \cos x \cos x + x^3 (\sin x)(-\sin x)$

12.  $dz/ds = r(4rs^{4r-1} - r) \cot\left(rs + \frac{3}{\sqrt{s}}\right) - r(s^{4r} - sr) \csc^2\left(rs + \frac{3}{\sqrt{s}}\right) \left(r - \frac{3}{2}s^{-3/2}\right) + r - \frac{1}{2\sqrt{s}}$