

More Derivatives

Directions: Do the problems.

1. Find $\frac{dy}{dx}$ for each of the following functions.

a. $y = \sin^4(x^3)$

b. $y = x^2 \sin^{-1} x$

c. $y = e^{\tan(x^2-2)}$

d. $y = \ln(7x - e^{2x})$

e. $y = \sec^{-1}(x^3 + 1)$

f. $y = \sqrt{\cot x} - 2x^{\frac{1}{3}}$

g. $y = (3x)^{x^2}$

h. $y = \frac{3x-5}{2x^2+1}$

i. $y = \frac{e^x}{\ln x}$

j. $y = (e^{\sin x})(x^3 - \cos x)$

k. $y = \tan^{-1}(\ln(x^2))$

l. $y = 3^{(e^x)}$

m. $y = (\sec^{-1} x)^x$

n. $x^2 - y^2 = xy$

o. $2xy + x^2y^2 = 1$

p. $x \cos(y^2) = 4y - 2$

q. $\tan(xy - 1) = 2x + y$

r. $y = (5 - x^2)^\pi$

s. $y = (x^2 + \ln x)^4$

t. $y = \ln(\ln(x^2))$

u. $y = \sec(x \sin x)$

v. $y = \sqrt{e^x - \cos(x^2)}$

w. $y = x^{\ln x}$

x. $y = (\sin 4x)(\tan(x^3 - 1))$

y. $y = x^2 e^{(e^x)}$

z. $y = \sqrt{\ln \sqrt{x}}$

2. Find the slope of the tangent line (or the slope of the function or the instantaneous rate of change) for each of the following functions at the given location.

a. $y = x^3 - 5x^2 - x - 1$ at $x = -1$

b. $y = x^3 \ln x$ at $x = 1$

c. $y = (\sin x)(\cos 2x)$ at $x = \frac{\pi}{6}$

d. $y = \frac{\tan x}{x}$ at $x = \frac{\pi}{4}$

e. $y = \tan^{-1}(x^2)$ at $x = \frac{1}{3}$

f. $y = \sqrt{x^2 - 3}$ at $x = 2$

g. $x^2 y^3 - x - y = 1$ at $(2, 1)$

h. $x^3 + y^2 = xy + 1$ at $(-1, 1)$

i. $x \cos y + y \cos x = y^2 + x$ at $(\pi, 0)$