

(1) Use the Chain Rule to compute the following derivatives.

a. $\frac{d}{dx}((-x^2 + 7x - 5)^4) =$

b. $\frac{d}{dx}(\sqrt{1 - 2x}) =$

c. $\frac{d}{dx}\left(\frac{1}{3 - \sqrt{x}}\right) =$

d. $\frac{d}{dx}\left(\frac{4x^3 - 1}{\sqrt{x^2 + 9}}\right) =$

(2) Find the equation of the line tangent to the graph of the functions below at the points indicated.

a. $f(x) = (-x^2 + 7x - 5)^4$ where $x = 1$

b. $f(x) = \sqrt{1 - 2x}$ where $x = -2$.

c. $f(x) = \frac{4x^3 - 1}{\sqrt{x^2 + 9}}$ where $x = 0$

(3) Use Implicit Differentiation to compute $\frac{dy}{dx}$ for each of these functions.

a. $xy = 1 + \frac{x}{y^2}$

b. $\sqrt{x + 3} + y = 2x^2y^2$

c. $\frac{y}{\sqrt{1+x^4}} = (1 + x^3)y$

(4) Find the equation of the line tangent to the graph of the equations below at the points indicated.

a. $\sqrt{x + 3} + y = 2x^2y^2 + 2$ at $(1, 0)$

b. $\frac{y}{\sqrt{1+x^4}} = (1 + x^3)y$ at $(0, 1)$