Sec. 3.7

p.175 #11-16 Find the deriv using chain rule

(11) $y = (x^4+5)^3$ $\quad u = x^4+5$ $\quad y = u^3$

$\frac{du}{dx} = 4x^3$ $\quad \frac{dy}{du} = 3u^2$

$y' = 3u^2 \cdot 4x^3 = \boxed{12x^3(x^4+5)^2}$

(12) $y = (8x^4+5)^3$ $\quad u = 8x^4+5$ $\quad y = u^3$

$\frac{du}{dx} = 32x^3$ $\quad \frac{dy}{du} = 3u^2$

$y' = 3u^2 \cdot 32x^3 = \boxed{96x^3(8x^4+5)^2}$

(13) $y = \sqrt{7x-3}$ $\quad u = 7x-3$ $\quad y = \sqrt{u}$

$\frac{du}{dx} = 7$ $\quad \frac{dy}{du} = \frac{1}{2\sqrt{u}}$

$y' = \frac{1}{2\sqrt{u}} \cdot 7 = \boxed{\frac{7}{2\sqrt{7x-3}}}$

(14) $y = (4-2x-3x^2)^5$ $\quad u = 4-2x-3x^2$ $\quad y = u^5$

$\frac{du}{dx} = -2-6x$ $\quad \frac{dy}{du} = 5u^4$

$y' = 5u^4 \cdot (-2-6x) = \boxed{5(-2-6x)(4-2x-3x^2)^4}$

(15) $y = (x^2+9x)^{-2}$ $\quad u = x^2+9x$ $\quad y = u^{-2}$

$\frac{du}{dx} = 2x+9$ $\quad \frac{dy}{du} = -2u^{-3}$

$y' = -2u^{-3} \cdot 2x+9 = \boxed{-2(2x+9)(x^2+9x)^{-3}}$

(16) $y = (x^3+3x+9)^{-4/3}$ $\quad u = x^3+3x+9$ $\quad y = u^{-4/3}$

$\frac{du}{dx} = 3x^2+3$ $\quad \frac{dy}{du} = \frac{-4}{3}u^{-7/3}$

$y' = \frac{-4}{3}u^{-7/3}(3x^2+3) = \frac{-4(3x^2+3)}{3}(x^3+3x+9)^{-7/3}$

or $-4(x^2+1)(x^3+3x+9)^{-7/3}$