1. p80e16 - Calcula las siguientes derivadas:

(a) $y = 2x$

Sol: $y' = 2$

(b) $y = 3x - 5$

Sol: $y' = 3$

(c) $y = 7x^5 - 3x^2 + x + 2345$

Sol: $y' = 35x^4 - 6x + 1$

(d) $y = x\,(x + 2)$

Sol: $y' = 2x + 2$

(e) $y = (x - 1)\,(x + 1)$

Sol: $y' = 2x$

(f) $y = \frac{5x^4}{7} - \frac{x^3}{55} - \frac{3x^2}{4} + x - 1255$

Sol: $y' = \frac{20x^3}{7} - \frac{3x^2}{55} - \frac{3x}{2} + 1$

(g) $y = (x + 1)^3$

Sol: $y' = 3\,(x + 1)^2$

(h) $y = \left(x^3 + x + 1\right)^4$

Sol: $y' = \left(12x^2 + 4\right)\left(x^3 + x + 1\right)^3$

(i) $y = -\,(3x - 1)^2 + (3x + 1)^2$

Sol: $y' = 12$

(j) $y = \frac{1}{x^2}$

Sol: $y' = -\frac{2}{x^3}$

(k) $y = \frac{1}{x+1}$

Sol: $y' = -\frac{1}{(x+1)^2}$

(l) $y = \frac{x^2-3}{x^3+x}$

Sol: $y' = \frac{2x}{x^3+x} + \frac{\left(-3x^2-1\right)\left(x^2-3\right)}{\left(x^3+x\right)^2}$

(m) $y = \frac{x+1}{x}$

Sol: $y' = \frac{1}{x} - \frac{x+1}{x^2}$

(n) $y = \frac{x^3\left(x^2-1\right)}{3} - 3$

Sol: $y' = \frac{2x^4}{3} + x^2\left(x^2 - 1\right)$

(ñ) $y = \frac{1}{x^3}$

Sol: $y' = -\frac{3}{x^4}$

(o) $y = \sqrt{x}$

Sol: $y' = \frac{1}{2\sqrt{x}}$

(p) $y = x^{\frac{2}{3}}$

Sol: $y' = \frac{2}{3\sqrt[3]{x}}$

(q) $y = \frac{1}{x^{\frac{2}{3}}}$

Sol: $y' = -\frac{2}{3x^{\frac{5}{3}}}$

(r) $y = \sqrt[6]{x} + \sqrt[5]{x} + \sqrt{x}$

Sol: $y' = \frac{1}{2\sqrt{x}} + \frac{1}{5x^{\frac{4}{5}}} + \frac{1}{6x^{\frac{5}{6}}}$

(s) $y = \sqrt{3}\sqrt{x}$

Sol: $y' = \frac{\sqrt{3}}{2\sqrt{x}}$

2. p80e16-cont - Calcula las siguientes derivadas:

(a) $y = x^{\frac{5}{2}}$

Sol: $y' = \frac{5x^{\frac{3}{2}}}{2}$

(b) $y = x^{\frac{10}{3}}$

Sol: $y' = \frac{10x^{\frac{7}{3}}}{3}$

(c) $y = \frac{1}{\sqrt{x}}$

Sol: $y' = -\frac{1}{2x^{\frac{3}{2}}}$

(d) $y = \left(1 - x^2\right)^3$

Sol: $y' = -6x\left(1 - x^2\right)^2$

(e) $y = \sqrt{2x - 4}$

Sol: $y' = \frac{1}{\sqrt{2x-4}}$

(f) $y = \sqrt{2 - x}$

Sol: $y' = -\frac{1}{2\sqrt{2-x}}$

(g) $y = \sqrt[3]{2}\,|x|^{\frac{2}{3}}$

Sol: $y' = \frac{2\sqrt[3]{2}\,\mathrm{sign}\,(x)}{3\sqrt[3]{|x|}}$

(h) $y = \sqrt{3x^2 - 1}$

Sol: $y' = \frac{3x}{\sqrt{3x^2-1}}$

(i) $y = \frac{2x}{\sqrt{x-1}}$

Sol: $y' = -\frac{x}{(x-1)^{\frac{3}{2}}} + \frac{2}{\sqrt{x-1}}$

(j) $y = \sqrt{\frac{1-x}{x+1}}$

Sol: $y' = \frac{\sqrt{\frac{1-x}{x+1}}(x+1)\left(-\frac{1-x}{2(x+1)^2} - \frac{1}{2(x+1)}\right)}{1-x}$

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

Sol: $y' = 2e^{2x}$

(l) $y = 2^{5x}$

Sol: $y' = 5 \cdot 2^{5x} \log(2)$

(m) $y = 8^{3x^2-1}$

Sol: $y' = 6 \cdot 8^{3x^2-1} x \log(8)$

(n) $y = a^x x^a$

Sol: $y' = \frac{aa^x x^a}{x} + a^x x^a \log(a)$

(ñ) $y = e^{\sqrt{x}}$

Sol: $y' = \frac{e^{\sqrt{x}}}{2\sqrt{x}}$

(o) $y = \frac{\log(2x-1)}{\log(10)}$

Sol: $y' = \frac{2}{(2x-1)\log(10)}$

(p) $y = \log(x + 3)$

Sol: $y' = \frac{1}{x+3}$