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: $y' = \frac{-x^4+10x^2+3}{x^2(x^4+2x^2+1)}$

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

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

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

Sol: $y' = \frac{5x^4}{3} - x^2$

(ñ) $y = \frac{1}{x^3}$

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

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

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

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

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

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

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

(r) $y = x^{\frac{1}{2}} + x^{\frac{1}{5}} + x^{\frac{1}{6}}$

Sol: $y' = \frac{\frac{x^{\frac{49}{30}}}{2} + \frac{x^{\frac{13}{10}}}{6} + \frac{x^{\frac{4}{3}}}{5}}{x^{\frac{32}{15}}}$

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

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

2. p80e16-cont - Calcula las siguientes derivadas:

(a) $y = \frac{x^3}{\sqrt{x}}$

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Sol: $y' = 5 \cdot 32^x \log(2)$

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

Sol: $y' = 9 \cdot 2^{9x^2-2} x \log(2)$

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

Sol: $y' = a^x x^{a-1}\left(a + x\log(a)\right)$

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

(q) $y = \cos(5x)$

Sol: $y' = -5\sin(5x)$

(r) $y = 3\tan(2x)$

Sol: $y' = \frac{6}{\cos^2(2x)}$

(s) $y = \sin^2(x)$

Sol: $y' = \sin(2x)$

(t) $y = \sin\left(x^2\right)$

Sol: $y' = 2x\cos\left(x^2\right)$

3. p80e17 - Calcula las siguientes derivadas:

(a) $y = \log\left(3x^2 - 7\right)$

Sol: $y' = \frac{6x}{3x^2-7}$

(b) $y = \log\left((x-2)^2\right)$

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

(c) $y = \frac{\log\left(x^2-2x\right)}{\log(10)}$

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

(d) $y = \frac{\log\left(2x^3+3x^2\right)}{\log(2)}$

Sol: $y' = \frac{6(x+1)}{x(2x+3)\log(2)}$

(e) $y = \sqrt{\log(x)}$

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

(f) $y = \frac{\log(x)}{x}$

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

(g) $y = \log\left(\frac{1-x}{x+1}\right)$

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

(h) $y = \log\left(x^{\frac{3}{4}}\right)$

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

(i) $y = \frac{\log(2x+1)}{\log(4)}$

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

(j) $y = \log\left(\frac{e^x}{e^x-1}\right)$

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

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

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

(l) $y = \frac{e^x}{x-1}$

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

(m) $y = e^{-x} + \frac{e^x-e^{-x}}{e^x}$

Sol: $y' = (2-e^x)\,e^{-2x}$

(n) $y = e^{\sqrt{x^2+1}}$

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

(ñ) $y = \sin(2x)$

Sol: $y' = 2\cos(2x)$

(o) $y = \sin(7x-3)$

Sol: $y' = 7\cos(7x-3)$

(p) $y = \cos(5x)$

Sol: $y' = -5\sin(5x)$

(q) $y = 3\tan(2x)$

Sol: $y' = \frac{6}{\cos^2(2x)}$

(r) $y = \sin^2(x)$

Sol: $y' = \sin(2x)$

(s) $y = \sin\left(x^2\right)$

Sol: $y' = 2x\cos\left(x^2\right)$

4. p80e17-cont - Calcula las siguientes derivadas:

(a) $y = \cos^2\left(x^2+1\right)$

Sol: $y' = -4x\sin\left(x^2+1\right)\cos\left(x^2+1\right)$

(b) $y = \tan^3(5x)$

Sol: $y' = \left(15\tan^2(5x)+15\right)\tan^2(5x)$

(c) $y = \sin^3(4x)$

Sol: $y' = 12\sin^2(4x)\cos(4x)$

(d) $y = \sqrt{\sin(2x)}$

Sol: $y' = \frac{\cos(2x)}{\sqrt{\sin(2x)}}$

(e) $y = \log(-\tan(x-1))$

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

(f) $y = \sqrt[3]{\sin(x)}$

Sol: $y' = \frac{\cos(x)}{3\sin^{\frac{2}{3}}(x)}$

(g) $y = \sin^3(x)\cos(x)$

Sol: $y' = -\sin^4(x)+3\sin^2(x)\cos^2(x)$

(h) $y = \sec(5x+2)$

Sol: $y' = 5\tan(5x+2)\sec(5x+2)$

(i) $y = \operatorname{asin}(2x)$

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

(j) $y = \operatorname{acos}\left(x^2\right)$

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

(k) $y = \operatorname{atan}\left(\frac{x-1}{1-x}\right)$

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

(l) $y = \operatorname{asin}\left(\frac{x+1}{x-1}\right)$

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

(m) $y = \tan^2(\sin(x))$

Sol: $y' = 2\left(\tan^2(\sin(x))+1\right)\cos(x)\tan(\sin(x))$

(n) $y = \sin^{\frac{1}{x}}(x)$

Sol: $y' = \left(\frac{\cos(x)}{x\sin(x)} - \frac{\log(\sin(x))}{x^2}\right)\sin^{\frac{1}{x}}(x)$

(ñ) $y = x^{\tan(x)}$

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

(o) $y = 2^{\log(\cos(x))}$

Sol: $y' = -\frac{2^{\log(\cos(x))}\log(2)\sin(x)}{\cos(x)}$

(p) $y = \sin^{\operatorname{atan}(x)}(x)$

Sol: $y' = \left(\frac{\cos(x)\operatorname{atan}(x)}{\sin(x)} + \frac{\log(\sin(x))}{x^2+1}\right)\sin^{\operatorname{atan}(x)}(x)$

(q) $y = \text{atan}^x\,(x)$

Sol: $y' = \left(\frac{x}{(x^2+1)\operatorname{atan}(x)} + \log(\operatorname{atan}(x))\right)\operatorname{atan}^x(x)$

(r) $y = x^{\sec(x)}$

Sol: $y' = x^{\sec(x)}\left(\log(x)\tan(x)\sec(x) + \frac{\sec(x)}{x}\right)$

5. p81e18 - Calcula las siguientes derivadas:

(a) $y = x^{\log(x)}$

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

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

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

(c) $y = \cos^{\sin(x)}(x)$

Sol: $y' = \left(\log(\cos(x))\cos(x) - \frac{\sin^2(x)}{\cos(x)}\right)\cos^{\sin(x)}(x)$