

1. p25e16 - Calcula las siguientes derivadas:

(a) $y = 2x$

Sol: $y' = 2$

(b) $y = 3x - 5$

Sol: $y' = 3$

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

Sol: $y' = 4x - 7$

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

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

(e) $y = x(x + 2)$

Sol: $y' = 2x + 2$

(f) $y = (x - 1)(x + 1)$

Sol: $y' = 2x$

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

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

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

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

(i) $y = (x^3 + x + 1)^4$

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

(j) $y = -(3x - 1)^2 + (3x + 1)^2$

Sol: $y' = 12$

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

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

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

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

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

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

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

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

(ñ) $y = \frac{x(x^2-1)}{3x^2-3}$

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

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

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

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

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

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

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

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

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

2. p25e16cont - Calcula las siguientes derivadas:

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

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

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

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

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

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

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

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

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

(l) $y = \sqrt{1}$

Sol: $y' = 0$

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

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

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

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

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

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

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

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

(f) $y = (1-x^2)^3$

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

(ñ) $y = 8^{3x^2-1}$

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

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

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

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

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

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

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

(p) $y = e^{\sqrt{x}}$

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

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

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

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

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

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

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

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

3. p25e17 - Calcula las siguientes derivadas:

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

(ñ) $y = \sin(2x)$

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

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

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

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

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

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

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

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

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

(h) $y = \log(\sqrt[4]{x^3})$

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

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

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

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

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

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

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

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

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

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

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

4. p25e17cont - Calcula las siguientes derivadas:

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

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

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

Sol: $y' = \frac{15 \tan^2(5x)}{\cos^2(5x)}$

(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: $y' = \tan(x-1) + \frac{1}{\tan(x-1)}$

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

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

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

(i) $y = \arcsin(2x)$

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

(j) $y = \arccos(x^2)$

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

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

Sol: $y' = 0$

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

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

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

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

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

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

(ñ) $y = x^{\tan(x)}$

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

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

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

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

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

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

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

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

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