

Soluciones Ejercicios de Derivadas (Pag 156 a 170)

Pag 156: 2) $(\operatorname{sen} x)^x \cdot \left(\ln \operatorname{sen} x + x \frac{\cos x}{\sin x} \right), \quad x^{\operatorname{sen} x} \left(\cos x \cdot \ln x + \frac{\sin x}{x} \right)$

Pag 157: 12) a) $y' = -\frac{x}{y}$ b) $y' = \frac{4-x}{y-3}$ c) $y' = -\frac{9x}{16y}$ d) $y' = \frac{25x}{9y}$

e) $y' = -\frac{x+1}{y}$ f) $y' = -\frac{14(x-1)}{8(y+3)}$

13) a) $y' = -\frac{2x+y}{x+2y}$ b) $y' = \frac{2x-y}{x-1}$ c) $y' = -\frac{3x^2+2y}{3y^2+2x}$ d) $y' = -\frac{2x+2y-3}{2x+2y+5}$

15) a) $y' = x^{3x} \cdot (3 \ln x + 3)$ b) $y' = x^{x+1} \cdot \left(\ln x + 1 + \frac{1}{x} \right)$

c) $y' = x^{e^x} \cdot \left(e^x \ln x + \frac{e^x}{x} \right)$ d) $y' = \left(1 + \frac{1}{x} \right)^x \left[\ln \left(1 + \frac{1}{x} \right) - \frac{1}{x+1} \right]$

e) $y' = (\operatorname{sen} x)^x \cdot \left(\ln \operatorname{sen} x + x \frac{\cos x}{\sin x} \right)$ f) $y' = x^{tgx} \left(\frac{\ln x}{\cos^2 x} + \frac{tgx}{x} \right)$

16) a) $y' = \left(\frac{3x-2}{5} \right)^{tgx} \cdot \left[\frac{1}{\cos^2 x} \ln \left(\frac{3x-2}{5} \right) + tgx \cdot \frac{5}{3x-2} \cdot \frac{3}{5} \right]$ b) $y' = x^{\operatorname{arcsen} x} \left(\frac{\ln x}{\sqrt{1-x^2}} + \frac{\operatorname{arcsen} x}{x} \right)$

c) $y' = (\ln x)^{x+1} \left[\ln(\ln x) + \frac{x+1}{x \ln x} \right]$ d) $y' = (\operatorname{arctg} x)^{2x} \left[2 \ln(\operatorname{arctg} x) + \frac{2x}{\operatorname{arctg} x} \cdot \frac{1}{1+x^2} \right]$

e) $y' = (\sqrt{x})^{\ln x} \left[\frac{\ln \sqrt{x}}{x} + \frac{\ln x}{\sqrt{x}} \cdot \frac{1}{2} \cdot \frac{1}{\sqrt{x}} \right] = \frac{\ln x}{x}$ f) $y' = \left(\frac{\sin x}{x} \right)^x \left[\ln(\operatorname{sen} x) + x \frac{\cos x}{\sin x} - \ln x - 1 \right]$

17) a) $y' = 3 \left(\frac{x^2+1}{x} \right) \left[\frac{x^2+1}{x^2} \right]$ b) $y' = \frac{1}{2} \left(\frac{1-x}{1+x} \right)^{\frac{1}{2}} \frac{(1-x) + (1+x)}{(1-x)^2}$

c) $y' = 3 \operatorname{sen}^2 x \cdot \cos^3 x - 2 \operatorname{sen}^4 x \cos x$ 19) $(-3, 6), (-3, -4)$

Pag 158: 1) $8x, -9(x-1) + 4, 11(x-3) + 150$ 2) $-\frac{2}{5}(x-3) + 3, \frac{2}{5}(x-3) - 7$

Pag 163: 1) $x = 5$

Pag 169: 1) 8: $\frac{\cos x}{\sin x}$ 9: $\frac{\ln x - 1}{\ln^2 x} + \frac{x e^x - e^x}{x^2}$ 25: $\cos(\cos 2x) \cdot (-\operatorname{sen} 2x) \cdot 2$

28: $3 \operatorname{sen}^2 x \cdot \cos x \cdot \cos x^3 + \operatorname{sen}^3 x (-\operatorname{sen} x^3) \cdot 3x^2$ 2) b) $y' = \frac{y - e^x}{1 - x}$

c) $y' = \frac{y}{\sqrt{xy}} y \left(\frac{1}{y} - \frac{x}{\sqrt{xy}} \right)^{-1}$

Pag 170 5) a) mínimo $(2, -16)$, máximo $(-2, 16)$ b) mínimo $(-1, -4)$ y $(1, -4)$ máximo $(0, -3)$
 c) min $(2, 0)$ d) max $(0, 1)$ e) min $(-1, -\frac{1}{2})$ max $(1, \frac{1}{2})$ f) min $(0, 1)$
 g) max $(0, 1)$

	punto inflexión	concava	convexa
a)	$(0, 0)$	$(0, \infty)$	$(-\infty, 0)$
b)	$(1, 2)$	$(1, \infty)$	$(-\infty, 1)$
c)	$(0, 0)$ y $(2, -16)$	$(-\infty, 0)$ y $(2, \infty)$	$(0, 2)$
d)	$(1, 1)$	$(-\infty, 1)$	$(1, \infty)$