

Respostas no final da página

1) Obtenha a derivada de cada uma das seguintes funções:

a) $y = (x^9 + 4)^3$;

b) $y = \cos x^6$;

c) $y = (\cos x)^6$;

d) $y = \ln(2x^4 + 3x)$;

e) $y = 5 \sin(x^4 + 2x)$;

f) $y = 8^{x^3+x}$;

g) $y = (\sin x^3)^6$;

h) $y = [\ln(2x^4 - x)]^5$;

i) $y = x^{3x}$, com $x > 0$;

j) $y = x^{\sin x}$, com $x > 0$;

k) $y = (\sin x)^{\cos x}$, com $\sin x > 0$;

l) $y = x^{\frac{3}{4}}$, com $x > 0$;

m) $y = 4x^{\sqrt{2}}$, com $x > 0$;

n) $y = \sqrt{x}$, com $x > 0$;

o) $y = (x^2 - 3x)^{\frac{1}{2}}$, com $x^2 - 3x > 0$.

2) Determine a derivada de cada uma das seguintes funções:

a) $y = (2x^3 - 3x + 2)^5$;

b) $y = \operatorname{tg}(x^4 + 3)$;

c) $y = (\sec x)^6$;

d) $y = \ln \sin x$;

e) $y = 4 \cos\left(2x^3 + \frac{\pi}{7}\right)$;

f) $y = 2^{2x+1}$;

g) $y = 3^{x^2+2x}$;

h) $y = (\cos x^5)^4$;

i) $y = (\ln \sin x)^3$;

j) $y = (3x)^x$, com $x > 0$;

k) $y = (\sin x)^x$, com $\sin x > 0$;

l) $y = x^{-\frac{3}{2}}$, com $x > 0$;

m) $y = \sqrt[6]{x^5}$, com $x > 0$;

n) $y = (x + \sin x)^{\frac{1}{3}}$, com $x + \sin x > 0$.

RESPOSTAS:

1) $y' = 27x^8(x^9 + 4)^2$; b) $y' = -6x^5 \sin x^6$; c) $y' = -6(\sin x)(\cos x)^5$; d) $y' = \frac{8x^3 + 3}{2x^4 + 3}$; e) $y' = 5(4x^3 + 2) \cos(x^4 + 2x)$;

f) $y' = 8^{x^3+x}(3x^2 + 1) \ln 8$; g) $y' = 18x^2(\sin x^3)^5 \cos x^3$; h) $y' = \frac{40x^3 - 5}{2x^4 - x} [\ln(2x^4 - x)]^4$; i) $y' = x^{3x}(3 \ln x + 3)$;

j) $y' = x^{\sin x} \left(\cos x \ln x + \frac{\sin x}{x} \right)$; k) $y' = (\sin x)^{\cos x} \left(-\sin x \ln \sin x + \frac{\cos^2 x}{\sin x} \right)$; l) $y' = \frac{3}{4} x^{-\frac{1}{4}}$; m) $y' = 4\sqrt{2} x^{\sqrt{2}-1}$;

n) $y' = \frac{1}{2} x^{-\frac{1}{2}}$; o) $y' = \frac{1}{2} (x^2 - 3x)^{-\frac{1}{2}} (2x - 3)$. 2) $y' = 5(2x^3 - 3x + 2)^4(6x^2 - 3)$; b) $y' = 4x^3 \sec^2(x^4 + 3)$;

c) $y' = 6(\sec x)^6 \operatorname{tg} x$; d) $y' = \operatorname{cotg} x$; e) $y' = -24x^2 \sin\left(2x^3 + \frac{\pi}{7}\right)$; f) $y' = 2^{2x+2} \ln 2$; g) $y' = 3^{x^2+2x}(2x + 2) \ln 3$;

h) $y' = -20x^4(\cos x^5)^3 \sin x^5$; i) $y' = 3(\ln \sin x)^2 \operatorname{cotg} x$; j) $y' = (3x)^x(\ln 3x + 1)$; k) $y' = (\sin x)^x [\ln \sin x + x \operatorname{cotg} x]$;

l) $y' = -\frac{3}{2} x^{-\frac{5}{2}}$; m) $y' = \frac{5}{6} x^{-\frac{1}{6}}$; n) $y' = \frac{1}{3} (x + \sin x)^{-\frac{2}{3}} (1 + \cos x)$.