

Differentiation Drill

Find the derivatives of the following functions:

$$(1) f(x) = 3x^5 - 5x^3 + 7$$

$$(2) y = \frac{x^2 + bx + c}{a}$$

$$(3) f(t) = e^\pi$$

$$(4) t(x) = \frac{4x^{3/4}}{3} - x^{-1}$$

$$(5) g(t) = \frac{t-1}{t^2-1}$$

$$(6) f(x) = \frac{x-1}{\sqrt[3]{x^4}}$$

$$(7) h(x) = (x^{1/2} + x^{2/3})(x^{3/4} + x^{4/5})$$

$$(8) g(x) = \sqrt{x}(x^{-3/4} + 2x^2)$$

$$(9) f(x) = \sin x(\sin x + \cos x)$$

$$(10) f(\alpha) = \sin(7\alpha) \csc(7\alpha)$$

$$(11) f(x) = (5x + 5)^{1001}$$

$$(12) g(t) = e^{1/t}$$

$$(13) h(x) = \sin(x^7)$$

$$(14) y = \frac{1}{\tan x}$$

$$(15) f(y) = \ln(2y) \cos(y^2)$$

$$(16) f(\theta) = \sqrt[3]{\tan(5\theta)}$$

$$(17) h(r) = \pi^r r^\pi$$

$$(18) y = \ln \sqrt{5 + x^2}$$

$$(19) f(x) = \cos(\ln(e^2))$$

$$(20) g(x) = x^{\cos x}$$

$$(21) f(x) = \frac{\ln(x^4)}{1 + \ln x}$$

$$(22) y = e^{\sin(\ln x)}$$

$$(23) f(\theta) = \csc(\cot \theta)$$

$$(24) l(s) = \sin(\ln(s^2))$$

$$(25) y = \sqrt[3]{1 + \sqrt{x}}$$

$$(26) f(x) = \ln \left(\frac{x+1}{x^2+1} \right)$$

$$(27) h(t) = t^3 e^{3t} \sin\left(\frac{t}{3}\right)$$

$$(28) p(s) = \sec \left(\frac{1 + \ln s}{s^2 \cos s} \right)$$

$$(29) f(x) = 5^x \sec x$$

$$(30) a(t) = \frac{\sqrt{t+1}(2-t)^5}{(t+3)^7}$$

$$(31) g(x) = e^{e^x}$$

$$(32) x(y) = (\sin(y - \sin y))^{-1}$$