

Calculus 12
6-5 Questions

1. Find the derivatives of the following functions.

a) $F(x) = (5 - 3x)^7$

b) $F(x) = (2x^2 + 1)^{20}$

c) $G(x) = (x^3 + x^2 - 2)^{\frac{3}{4}}$

d) $G(x) = \sqrt{x^4 - x + 1}$

e) $y = \sqrt[4]{x^2 + x}$

f) $y = (1 + 3x + 4x^2)^{-3}$

g) $y = \frac{1}{(x^3 + 2x^2 + 1)^2}$

h) $y = \frac{4}{\sqrt{9 - x^2}}$

i) $y = (1 + 2\sqrt{x})^6$

j) $y = \sqrt{x + \sqrt{x}}$

k) $y = x - \sqrt[5]{1 + x^5 - 6x^{10}}$

l) $y = x^2 + (x^2 - 1)^5$

2. Differentiate.

a) $F(x) = x\sqrt{x^2 + 1}$

b) $F(x) = (2x + 1)(4x - 1)^5$

c) $G(x) = (x^2 - 1)^4(2x - 3)$

d) $G(x) = (x^4 - x + 1)^2(x^2 - 2)^3$

e) $F(x) = \frac{x}{\sqrt{2x + 3}}$

f) $f(t) = \frac{(1 + 2t)^5}{(3t^2 - 5)^2}$

g) $g(x) = \left(\frac{x+2}{x-2}\right)^3$

h) $h(t) = \left(\frac{t^2 + 1}{t + 1}\right)^{10}$

$$\text{i) } y = \sqrt{\frac{x^2 - 1}{x^2 + 1}}$$

$$\text{j) } y = \frac{(2x+3)^3}{\sqrt{4x-7}}$$

$$\text{k) } y = 3\sqrt{x} \left(2x+1\right)^5 + \sqrt{4x-3}$$

$$\text{l) } y = \sqrt{1 + \sqrt[3]{x}}$$

$$\text{m) } y = \left(t + \sqrt[3]{t+t^2}\right)^{20}$$

$$\text{n) } y = \sqrt{x + \sqrt{x + \sqrt{x}}}$$