

More practice with derivatives:

1.)  $f(x) = 5x^2 + 2x - 1$  find  $f'(x)$

2.)  $g(x) = \ln(3x^2 + 2)$  find  $g'(x)$

3.)  $h(x) = \sqrt{\ln(2x)}$  find  $h'(x)$

4.)  $f(x) = \log_3 \sqrt{x^3 - 1}$  find  $f'(x)$

5.)  $g(x) = \frac{3}{x^2 + 1}$  find  $g'(x)$

6.)  $h(x) = (x^2 + 2x - 5)^{10}$  find  $h'(x)$

7.)  $k(x) = 2xe^{5x^2 + 2x - 1}$  find  $k'(x)$

8.)  $l(x) = \frac{2x^2 + 1}{3 - x^2}$  find  $l'(x)$

9.)  $n(x) = 5^x$  find  $n'(x)$

10.)  $p(x) = (5)3^{x^2 + 2}$  find  $p'(x)$

11.)  $q(x) = x^2 \sqrt{e^{2x} + x^2}$  find  $q'(x)$

12.)  $y = e^{3y+x} - x^2$  find  $\frac{dy}{dx}$

13.)  $xy = xy^2 + 2$  find  $\frac{dy}{dx}$

14.)  $g(x) = \frac{1}{2}x^2 \ln x^2$  find  $g'(x)$

15.)  $F(x) = \left[ \ln \left( \frac{5x^3 + 3e^{4x^2}}{\sqrt[3]{x^2 - 3x}} \right) \right]^3$  find  $F'(x)$

### Solutions

1.)  $f'(x) = 10x + 2$

2.)  $g'(x) = \frac{6x}{3x^2 + 2}$

3.)  $h'(x) = \frac{1}{2x\sqrt{\ln(2x)}}$

4.)  $f'(x) = \frac{3x^2}{(\ln 9)(x^3 - 1)}$

5.)  $g'(x) = \frac{-6x}{(x^2 + 1)^2}$

6.)  $h'(x) = 10(x^2 + 2x - 5)^9(2x + 2)$

7.)  $k'(x) = 2e^{5x^2+2x-1} + 2x(10x + 2)e^{5x^2+2x-1}$

8.)  $l'(x) = \frac{14x}{(3-x^2)^2}$

9.)  $n'(x) = (\ln 5)5^x$

10.)  $p'(x) = 10x \ln 3(3^{x^2+2})$

11.)  $q'(x) = \frac{3x^3 + 2xe^{2x} + x^2e^{2x}}{\sqrt{e^{2x} + x^2}}$

12.)  $\frac{dy}{dx} = \frac{e^{3y+x} - 2x}{1 - 3e^{3y+x}}$

13.)  $\frac{dy}{dx} = \frac{y^2 - y}{x - 2xy}$

14.)  $g'(x) = x \ln x^2 + x$

15.)  $F'(x) = 3 \left[ \ln \left( \frac{5x^3 + 3e^{4x^2}}{\sqrt[3]{x^2} - 3x} \right) \right]^2 \cdot \left[ \frac{15x^2 + 24xe^{4x^2}}{5x^3 + 3e^{4x^2}} - \frac{2 - 9\sqrt[3]{x}}{3x - 9\sqrt[3]{x^4}} \right]$