

$$y = 3x^2 - 5x + 2$$

$$\frac{dy}{dx} = y' = 6x - 5$$

Examples

Power rule

$$(x^n)' = nx^{n-1}$$

$$x^{-a} = \frac{1}{x^a}$$

$$x^{\frac{1}{n}} = \sqrt[n]{x}$$

$$x^{\frac{m}{n}} = \sqrt[n]{x^m}$$

$$= (\sqrt[n]{x})^m$$

$$f(x) = \frac{5}{x^3} = 5x^{-3}$$

$$f'(x) = -15x^{-4} = -\frac{15}{x^4}$$

$$g(x) = 7x^3 - \frac{5}{x^3} = 7x^3 - 5x^{-3}$$

$$g'(x) = 21x^2 + 15x^{-4} = 21x^2 + \frac{15}{x^4}$$

$$y = 4 \sqrt[3]{x^5} = 4x^{\frac{5}{3}}$$

$$4 \cdot \frac{5}{3} = \frac{4 \cdot 5}{1 \cdot 3} = \frac{20}{3}$$

$$y' = 4 \cdot \frac{5}{3} x^{\frac{5}{3}-1} = \frac{20}{3} x^{\frac{2}{3}} = \frac{20}{3} \sqrt[3]{x^2}$$

$$\frac{5}{3} - 1 = \frac{5}{3} - \frac{3}{3} = \frac{2}{3}$$

$$y = \sqrt{x} = x^{\frac{1}{2}}$$

$$y' = \frac{1}{2} x^{\frac{1}{2}-1} = \frac{1}{2} x^{-\frac{1}{2}} = \frac{1}{2} \cdot \frac{1}{x^{\frac{1}{2}}} = \frac{1}{2\sqrt{x}}$$