Differentiation by Rule

$$y = x^n$$

$$\frac{dy}{dx} = nx^{n-1}$$

Multiply by power and reduce the power by 1.

$$y = x^3 + 5x^2 + 7x + 9.$$

$$\frac{dy}{dx} = 3x^2 + 10x + 7$$

$$y = 6x^2 + 11x + 20$$

$$\frac{dy}{dx} = 12x + 11$$

$$y = 15x + 3$$

$$\frac{dy}{dx} = 15$$

Standard Form.

$$y = x^n + x^m +$$

$$y = \text{maths tables.}$$

Find $\frac{dy}{dx}$ when

$$y = (2x+1)(3x+5)$$

$$\frac{dy}{dx} = 2(3) = 6 \Rightarrow y = 6x + c$$

$$y = 6x^2 + 10x + 3x + 5$$

$$y = 6x^2 + 13x + 5.$$

$$y = \frac{4x^2 - 25}{2x - 5}$$

$$(2x - 5)y = 4x^2 - 25$$

$$2xy - 5y = 4x^2 - 25.$$

$$y = \frac{4x^2 - 25}{2x - 5}$$

$$y = \frac{(2x-5)(2x+5)}{2x-5}$$

$$\frac{dy}{dx} = 2.$$

$$y = \frac{x^2 - 7x + 12}{x - 3}$$

$$y = \frac{(x-3)(x-4)}{x-3}$$

$$\frac{dy}{dx} = 1$$

$$y = 1x^1$$

$$\frac{dy}{dy} = 1x^0$$

$$y = \frac{1}{x^2} \qquad \frac{1}{a^p} = a^{-p}$$

$$y = x^{-2}$$

$$\frac{dy}{dx} = -2x^{-3} = \frac{-2}{x^3}$$

$$y = \sqrt{x}$$

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

$$\frac{dy}{dx} = \frac{1}{2}x^{-\frac{1}{2}} = \frac{1}{2}\frac{1}{x^{\frac{1}{2}}}$$

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