

Student Name: \_\_\_\_\_

Score: \_\_\_\_\_

### Derivatives using Quotient Rule

Sheet 1

Find the derivatives using quotient rule:

$$y = \frac{x}{x+1}$$

$$y = \frac{x^2}{3x-1}$$

$$y = \frac{4x^3 - 7x}{5x^2 + 2}$$

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

$$y = \frac{x^9 - 1}{\sqrt{x^2 - 1}}$$

$$y = \frac{4x^2}{x^3 + 3}$$

$$y = \frac{x^3}{\sqrt{x} + 1}$$

$$y = \frac{x+1}{x-1}$$

$$y = \frac{x^2 + 3}{x^2 + 4}$$

$$y = \frac{\sqrt{x}}{x + \frac{7}{2}}$$

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**Answer key**

**Derivatives using Quotient Rule**

Sheet 1

$$\frac{dy}{dx} = \frac{1}{(x+1)^2}$$

$$\frac{dy}{dx} = \frac{3x^2 - 2x}{(3x-1)^2}$$

$$\frac{dy}{dx} = \frac{20x^4 + 59x^2 - 14}{(5x^2 + 2)^2}$$

$$\frac{dy}{dx} = \frac{4x(x^2 - 1)^2(x^2 + 2)}{(x^2 + 1)^2}$$

$$\frac{dy}{dx} = \frac{9x^8 \sqrt{x^2 - 1} - \frac{x(x^9 - 1)}{\sqrt{x^2 - 1}}}{(x^2 - 1)}$$

$$\frac{dy}{dx} = \frac{-4x^4 + 24x}{(x^3 + 3)^2}$$

$$\frac{dy}{dx} = \frac{\frac{5}{2}x^{\frac{5}{2}} + 3x^2}{(\sqrt{x} + 1)^2}$$

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

$$\frac{dy}{dx} = \frac{2x}{(x^2 + 4)^2}$$

$$\frac{dy}{dx} = \frac{\frac{-1}{2}\sqrt{x} + \frac{7}{4\sqrt{x}}}{\left(x + \frac{7}{2}\right)^2}$$