

$$58) \frac{\cos \theta - 1}{(1 - \cos \theta)^2} = \frac{1}{\cos \theta - 1}$$

$$66) y = \frac{2}{9}x - \frac{1}{9}$$

$$86) \frac{dP}{dV} = -\frac{k}{V^2}$$

$$106) f'(-2) = -4$$

$$108) f'(-2) = 14$$

$$25) f(x) = \frac{4 - 3x - x^2}{x^2 - 1}$$

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

$$= \frac{-3x^2 - 2x^3 + 3 + 2x - 8x + 6x^2 + 2x^3}{(x^2-1)^2}$$

$$= \frac{3x^2 - 6x + 3}{(x^2-1)^2} = \frac{3(x^2 - 2x + 1)}{(x^2-1)^2} = \frac{3(x-1)^2}{[(x+1)(x-1)]^2}$$

$$\boxed{\frac{3}{(x+1)^2}}$$

$$29) f(x) = \frac{3x-1}{\sqrt{x}}$$

$$f'(x) = \frac{3\sqrt{x} - \frac{3x-1}{2\sqrt{x}}}{x}$$

$$= \frac{6x - (3x-1)}{2x\sqrt{x}}$$

$$= \frac{3x+1}{2x\sqrt{x}}$$

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

$$33) f(x) = \frac{2 - \frac{1}{x}}{x-3} = \frac{2x-1}{x(x-3)} = \frac{2x-1}{x^2-3x}$$

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

$$37) f(x) = \frac{x^2+c^2}{x^2-c^2}$$

$$f'(x) = \frac{2x(x^2-c^2) - 2x(x^2+c^2)}{(x^2-c^2)^2}$$

$$49) -\csc x - \sin x = y$$

$$\frac{dy}{dx} = -[-\csc x \cot x] - [\cos x]$$

$$= \csc x \cot x - \cos x$$

$$\frac{\cos x}{\sin^2 x} - \frac{\cos x \cdot \sin^2 x}{\sin^2 x}$$

$$\frac{\cos x(1 - \sin^2 x)}{\sin^2 x} = \frac{\cos x(\cos^2 x)}{\sin^2 x}$$

$$\boxed{\csc x \cot^2 x}$$

$$58) f(\theta) = \frac{\sin \theta}{1 - \cos \theta}$$

$$f'(x) = \frac{\cos \theta(1 - \cos \theta) - \sin \theta(\sin \theta)}{(1 - \cos \theta)^2}$$

$$= \frac{\cos \theta - \cos^2 \theta - \sin^2 \theta}{(1 - \cos \theta)^2}$$

$$= \frac{\cos \theta - 1}{(1 - \cos \theta)^2} = \frac{-1}{1 - \cos \theta}$$