Slope of a Polar Curve

Find the slope of the cardioid $r = 2(1+\cos\theta) = f(\theta)$ @ $r = \theta/6$

$x = r\cos\theta$

$y = r\sin\theta$

$r = -2\sin\theta$

$$\frac{dy}{dx} = \frac{dy/d\theta}{dx/d\theta} = \frac{f'(\theta)\sin\theta + f(\theta)\cos\theta}{f'(\theta)\cos\theta - f(\theta)\sin\theta}$$

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

$\theta = \pi/6$ $\quad \frac{dy}{dx} = -1$