

Name: _____

Find the equation of the normal line to $y = 3x^2 + 8\sqrt{x}$ at the point $(4, 64)$.

$$y' = 6x + 4x^{-1/2}$$
$$y' \big|_{x=4} = 24 + \frac{4}{2}$$
$$= 26$$

$$m_{\text{tan}} = 26$$

$$m_{\text{normal}} = -\frac{1}{26}$$

$$y - y_1 = m(x - x_1)$$

$$y - 64 = -\frac{1}{26}(x - 4)$$

$$\text{or } 26y - 1664 = -x + 4$$

$$\text{or } x + 26y = 1668$$