

$$30. \quad f(x) = \frac{3x - 1}{\sqrt{x}} = 3x^{1/2} - x^{-1/2}$$

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

Alternate solution:

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

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

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

$$= \frac{3x + 1}{2x^{3/2}}$$