

Name _____

SHOW AS MUCH WORK AS POSSIBLE BECAUSE YOU MAY RECEIVE PARTIAL CREDIT FOR THE WORK YOU DO IF YOUR ANSWER IS INCORRECT.

1. Set up (**but don't solve**) the derivative of $f(x) = \sqrt{x}$ using **both** of the derivative definitions. (DON'T USE THE POWER RULE.)

$$f'(x) = \lim_{x \rightarrow a} \frac{\sqrt{x} - \sqrt{a}}{x - a}$$

$$f'(x) = \lim_{h \rightarrow 0} \frac{\sqrt{x+h} - \sqrt{x}}{h}$$

2. Find y' where $y = 2x\sqrt{x} - 2\ln x$.
(HINT: Rewrite $x\sqrt{x}$ as x^k for some number k .)

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

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

$$y' = 3\sqrt{x} - \frac{2}{x}$$