

1. Find the local linearization of $f(x) = \sqrt{x}$ at $a = 16$.

Solution: We have $f'(x) = \frac{1}{2}x^{-\frac{1}{2}}$, so that $f'(16) = \frac{1}{2}(16)^{-\frac{1}{2}} = \frac{1}{8}$. Since $f(16) = 4$, the local linearization is given by

$$L(x) = 4 + \frac{1}{8}(x - 16).$$

2. (Extra credit) Complete the definition: A function f with domain D has a *local minimum* at c if ...

... there exists an open interval I containing c such that $f(x) \geq f(c)$ for all x in I .