## Question 19264

Linearization of function at given point is the best linear approximation of this function. In geometric sense, this is approximation of function by a slope at given point. In terms of Taylor series, this is the expansion at given point, to terms of power of 1.

The general formula for Taylor expansion at point a is: $f(x)=f(a)+\sum_{k=1}^{\infty} f^{(k)}|_{x=a}\cdot(x-a)^k$ .

$f^{(k)}$ denotes the k-th derivative, and $|_{x=a}$ denotes that this derivative is taken at point a.

Hence, $f(x)=\sqrt{x}$ :

$L(x)=\sqrt{a}+\frac{1}{2\sqrt{x}}|_{x=a}\cdot(x-a)$ , so for $a=64, x=64.3$ :

$\sqrt{64.3}=8+\frac{1}{2\cdot 8}\cdot 0.3=8.019$