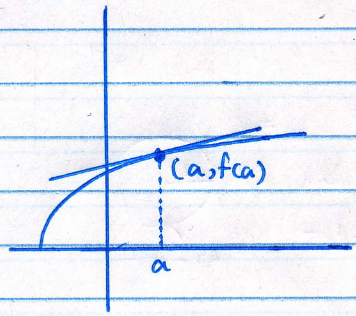
check that $A'(x)=0 \Rightarrow x=\frac{90}{(\pi\sqrt{3}+9)} \approx 6.23$ Constraint : $0<x<10$ $(0,10)$

$A(0)=\frac{25}{\pi} \approx 7.96$, $A(10)=\frac{25\sqrt{3}}{9} \approx 4.82$, $A\left(\frac{90}{(\pi\sqrt{3}+9)}\right) \approx 3.00$

Hence the minimum value of the area is 3cm, and the max occurs at $x=0$, and the maximum area is $7.96\ cm^2$ //

Linear Approximation:

Suppose $f(x)$ is a continuous function in an interval that contain the point a and assume that f is differentiable at a. Idea of linear approximation $f(x)$ at a through linear functions.



Equation of the tangent to the curve $y=f(x)$ at $x=a$

(x_0, y_0), $(y-y_0)=m(x-x_0)$
slope.

at $x=a \rightarrow (f(x)-f(a))=f'(x)(x-a)$

Hence equation of the tangent line to $y=f(x)$ at $(a, f(a))$ is given by $f(x)-f(a)=f'(a)(x-a)$

$\Rightarrow f(x)=f(a)+f'(a)(x-a)$ ⇝ Linear approximation. to $f(x)$ at $x=a$, denoted $L(x)$

If b is very close to a, then an approximate value for $f(b)$ is given by $L(b)$.

$f(x)=f(a)+f'(a)(x-a)$ //

$f(x)=f(a)+f'(a)(x-a)+f''(a)(x-a)^2 + f'''(x-a)^3 \ldots\ldots f^{(n)}(a)(x-a)^n$