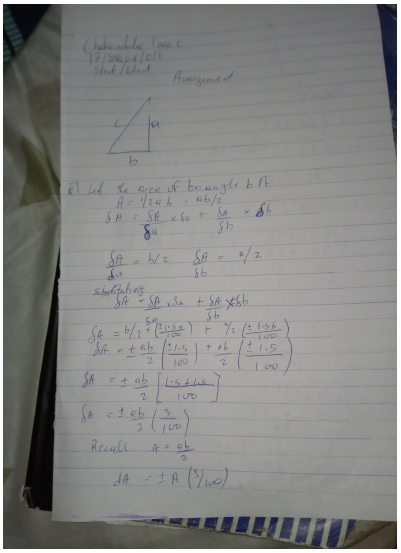


a) let the area of triangle be A

$A = \frac{1}{2}ab = ab/2$

$\delta A = \frac{\delta A}{\delta a}\times \delta a + \frac{\delta A}{\delta b}\times \delta b$

$\frac{\delta A}{\delta a} = b/2 \qquad \frac{\delta A}{\delta b} = a/2$

substituting

$\delta A = \frac{\delta A}{\delta a}\times \delta a + \frac{\delta A}{\delta b}\times \delta b$

$\delta A = b/2 \times \left(\frac{\pm 1.5a}{100}\right) + a/2 \left(\frac{\pm 1.5b}{100}\right)$

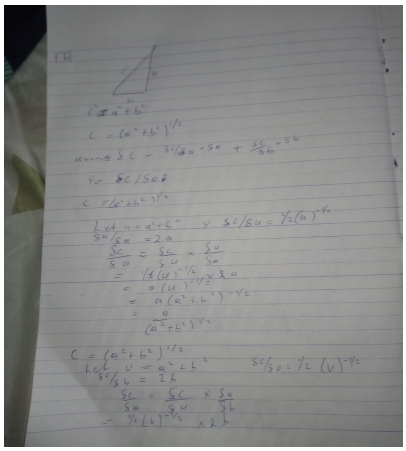
$\delta A = \pm\frac{ab}{2}\left(\frac{\pm 1.5}{100}\right) + \frac{ab}{2}\left(\frac{\pm 1.5}{100}\right)$

$\delta A = \pm\frac{ab}{2}\left[\frac{1.5+1.5}{100}\right]$

$\delta A = \pm\frac{ab}{2}\left(\frac{3}{100}\right)$

Recall $A = \frac{ab}{2}$

$\delta A = \pm A\left(\frac{3}{100}\right)$



$c = a^2+b^2$

$c = (a^2+b^2)^{1/2}$

using $\delta C = \frac{\delta C}{\delta a}\cdot\delta a + \frac{\delta C}{\delta b}\cdot\delta b$

For $\delta C/\delta a$

$c = (a^2+b^2)^{1/2}$

Let $u = a^2+b^2$ $\quad \delta c/\delta u = \frac{1}{2}(u)^{-1/2}$

$\frac{\delta u}{\delta a} = 2a$

$\frac{\delta c}{\delta a} = \frac{\delta c}{\delta u}\times\frac{\delta u}{\delta a}$

$= \frac{1}{2}(u)^{-1/2}\times 2a$

$= a(u)^{-1/2}$

$= a(a^2+b^2)^{-1/2}$

$= \frac{a}{(a^2+b^2)^{1/2}}$

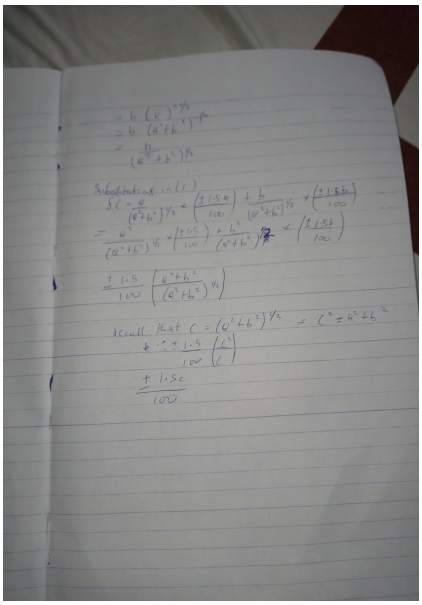
$c = (a^2+b^2)^{1/2}$

let $u = a^2+b^2$ $\quad \delta c/\delta u = \frac{1}{2}(u)^{-1/2}$

$\delta u/\delta b = 2b$

$\frac{\delta c}{\delta a} = \frac{\delta c}{\delta u}\times\frac{\delta u}{\delta b}$

$= \frac{1}{2}(u)^{-1/2}\times 2b$



$= b(u)^{-1/2}$

$= b(a^2+b^2)^{-1/2}$

$= \frac{b}{(a^2+b^2)^{1/2}}$

Substituting in (1)

$\delta C = \frac{a}{(a^2+b^2)^{1/2}}\times\left(\frac{\pm 1.5a}{100}\right) + \frac{b}{(a^2+b^2)^{1/2}}\times\left(\frac{\pm 1.5b}{100}\right)$

$= \frac{a}{(a^2+b^2)^{1/2}}\times\left(\frac{\pm 1.5}{100}\right) + \frac{b}{(a^2+b^2)^{1/2}}\times\left(\frac{\pm 1.5b}{100}\right)$

$\frac{\pm 1.5}{100}\left(\frac{a^2+b^2}{(a^2+b^2)^{1/2}}\right)$

recall that $C = (a^2+b^2)^{1/2} \Rightarrow C^2 = a^2+b^2$

$\therefore \frac{\pm 1.5}{100}\left(\frac{C^2}{C}\right)$

$\frac{\pm 1.5c}{100}$