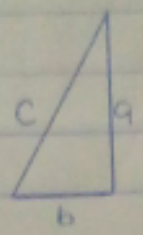
1b)



$c^2 = a^2 + b^2$

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

Using, $\delta c = \delta c/\delta a \cdot \delta a + \delta c/\delta b \cdot \delta b$ —— (1)

For $\delta c/\delta a$;

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

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

$\delta u/\delta a = 2a$

$\delta c/\delta a = \delta c/\delta u \times \delta u/\delta a$

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

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

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

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

$\delta c/\delta b$;

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

Let $v = a^2+b^2$ while $\delta c/\delta v = 1/2 (v)^{-1/2}$

$\delta v/\delta b = 2b$

$\delta c/\delta a = \delta c/\delta u \times \delta u/\delta b$

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

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

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

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

Substituting in ①

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

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

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

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

$$\Rightarrow \frac{\pm 1.5}{100}\left[\frac{C^2}{C}\right]$$

$$= \frac{\pm 1.5\,C}{100}.$$

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