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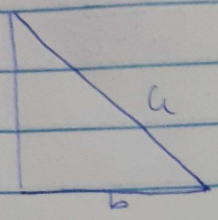
17/ENG 06/053
Mechanical Engineering



recall, Area of $\Delta = A = \frac{1}{2}bxa, \frac{1}{2}ba$

$$\partial A = \frac{\partial A}{\partial b}.\partial b + \frac{\partial A}{\partial a}.\partial a$$

$$\partial A = \frac{a}{2}.\partial b + \frac{b}{2}.\partial a$$

$$\partial b = \frac{\pm 0.5}{100} \times b \quad , \partial a = \frac{\pm 0.5}{100}.a = \frac{\pm a}{200}$$

$$= \frac{\pm b}{200}$$

$$\therefore \partial A = \frac{ab}{2}\left(\frac{1}{100}\right)$$

Recall, $c = \sqrt{a^2+b^2}$

$$\partial c = \frac{\partial c}{\partial a}.\partial a + \frac{\partial c}{\partial b}.\partial b$$

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

let $U = a^2+b^2$

$$\frac{\partial c}{\partial a} = \frac{\partial c}{\partial U} \times \frac{\partial U}{\partial a} \qquad \frac{\partial c}{\partial b} = \frac{\partial c}{\partial U} \times \frac{\partial U}{\partial b}$$

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

$\frac{du}{da} = \frac{a}{\sqrt{a^2+b^2}}$

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

$\frac{du}{db} = \frac{b}{\sqrt{a^2+b^2}}$