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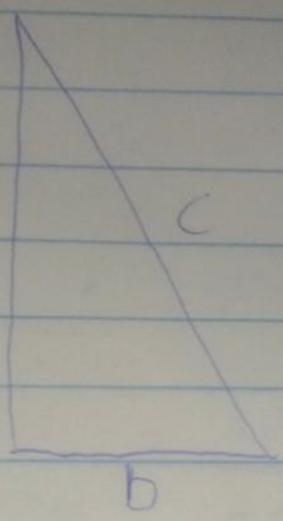
17/ENG02/091
Computer Engineering



$$\text{Area} = \frac{1}{2} \times b \times a = \frac{ab}{2}$$

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

$$\frac{\partial A}{\partial a} = \frac{b}{2}, \quad \frac{\partial A}{\partial b} = \frac{a}{2}$$

∴ Area considering the possible error of $\pm 1.5\%$

$$= \frac{\partial A}{\partial a} \pm \frac{1.5}{100} + \frac{\partial A}{\partial b} \pm \frac{1.5}{100}$$

$$= \frac{b}{2} \pm \frac{1.5}{100} + \frac{a}{2} \pm \frac{1.5}{100}$$

$$= \frac{b}{2} + \frac{a}{2}\left(\frac{1.5}{100} + \frac{1.5}{100}\right)$$

$$= \frac{ab}{2} \pm 3\%$$

2 $C = \sqrt{a^2+b^2}$

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

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

$C = u^{1/2}$

$\frac{dy}{du} = \frac{1}{2} u^{-1/2} = \frac{1}{2\sqrt{u}} = \frac{1}{2\sqrt{a^2+b^2}}$

$\frac{\partial u}{\partial a} = 2a, \quad \frac{\partial u}{\partial b} = 2b$

$\frac{\partial C}{\partial u} \times \frac{\partial u}{\partial a} = \frac{\partial C}{\partial a} = \frac{1}{2\sqrt{a^2+b^2}} \times 2a$

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

$\frac{\partial C}{\partial u} \times \frac{\partial u}{\partial b} = \frac{\partial C}{\partial b} = \frac{1}{2\sqrt{a^2+b^2}} \times 2b$

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

$\partial a = \pm 1.5\% a$

$= \pm 0.015 a$

$\partial b = \pm 1.5\% b$

$= \pm 0.015 b$

$\partial C = \frac{\partial C}{\partial a} \cdot \partial a + \frac{\partial C}{\partial b} + \partial b$

$$= \pm \frac{a}{\sqrt{a^2+b^2}} \cdot 0.015a \pm \frac{b}{\sqrt{a^2+b^2}} \cdot 0.015b$$

$$= \pm \frac{a^2 \cdot 0.015}{\sqrt{a^2+b^2}} + \frac{b^2}{\sqrt{a^2+b^2}} \cdot 0.013$$

$$= \pm (a^2+b^2)\left(\frac{0.015}{\sqrt{a^2+b^2}}\right.$$

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

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

$$\therefore = \pm c^2 \cdot \frac{0.015}{c}$$

$$= \pm c \cdot 0.015$$

$$= \pm 1.5\% \text{ of } c$$