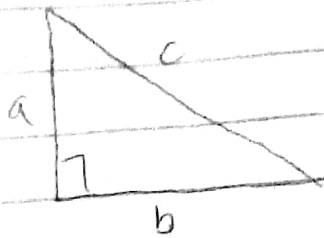


Arithmetic Progression
 17/10/2018
 Mechanical Engineering

$\frac{2}{200} +$



1) $A = \frac{1}{2}ab$ $\delta a = \pm 5\% \text{ of } a$ $\delta b = \pm 1.5\% \text{ of } b$

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

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

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

$$= \frac{b}{2} \left[\frac{\pm 1.5 a}{100} \right] + \frac{a}{2} \left[\frac{\pm 1.5 b}{100} \right]$$

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

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

$$\frac{\pm ab}{2} \left[\frac{3}{100} \right]$$

$$\frac{\pm ab}{2} \text{ of } 3\%$$

MAN
 NOT = $\frac{\pm ab}{2}$ of 5%

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

$$\frac{\delta C}{\delta a} = \frac{1}{2} (2a) (\sqrt{a^2 + b^2})^{-1/2} = \frac{a}{\sqrt{a^2 + b^2}} \quad \delta a = \pm 1.5\% a$$

$$\frac{\delta C}{\delta b} = \frac{1}{2} (2b) (\sqrt{a^2 + b^2})^{-1/2} = \frac{b}{\sqrt{a^2 + b^2}} \quad \delta b = \pm 1.5\% b$$

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

$$= \frac{a}{\sqrt{a^2 + b^2}} \left[\frac{\pm 1.5 a}{200} \right] + \frac{b}{\sqrt{a^2 + b^2}} \left[\frac{\pm 1.5 b}{200} \right]$$

$$= \pm 1.5 \left[\frac{a^2}{200 \sqrt{a^2 + b^2}} + \frac{b^2}{200 \sqrt{a^2 + b^2}} \right]$$

$$= \frac{\pm 1.5}{200} \left[\frac{a^2 + b^2}{\sqrt{a^2 + b^2}} \right]$$

$$= \frac{\pm 1.5}{200} \left[(a^2 + b^2)^{1 - 1/2} \right]$$

$$= \frac{\pm 1.5}{200} \left[\sqrt{a^2 + b^2} \right]$$

$$= \pm 1.5 \text{ of } C.$$

$$= \pm 1.5\% \text{ of } C.$$

Hence maximum Percent = $\pm 1.5\%$ of C.