$$\Delta y = \frac{kwd^4}{t^3} \cdot \frac{3}{100} + \frac{kwd^4}{t^3} \cdot \frac{2.5 \cdot 4}{100} - \frac{kwd^4}{t^3} \cdot \frac{12}{100}$$

$$\Delta y = \frac{kwd^4}{t^3} \left(\frac{3}{100} + \frac{10}{100} - \frac{12}{100} \right)$$

$$\Delta y = \frac{kwd^4}{t^3} \left(\frac{1}{100} \right)$$

$$y = \frac{kwd^4}{t^3}$$

$$\therefore \Delta y = \frac{1}{100} y$$

$$= 1\% \, y$$

Change in $y = \pm 1\%$.

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16/ENG02/058.

1. $P = \frac{E^2}{R}$

$E = 200V$ $\quad R = 8\Omega$

$\Delta E = -5V$ $\quad \Delta R = 0.2\Omega$.

$\Delta P = \frac{dP}{dE} \cdot \Delta E + \frac{dP}{dR} \cdot \Delta R$.

$\frac{dP}{dE} = \frac{2E}{R}$ $\quad \frac{dP}{dR} = \frac{-E^2}{R^2}$

$\Delta P = \frac{2(200)(-5)}{8} + \frac{-(200)^2}{8^2} \cdot (0.2)$.

$\Delta P = -250 - 125$

$\Delta P = -375W$.

Change in P is $-375W$

2. $y = \frac{kwd^4}{t^3}$

$\Delta w = \frac{3}{100} w$ $\quad \Delta d = \frac{2.5}{100} d$

$\Delta t = \frac{4}{100} t$

$\frac{dy}{dw} = \frac{kd^4}{t^3}$ $\quad \frac{dy}{dd} = \frac{4kwd^3}{t^3}$ $\quad \frac{dy}{dt} = \frac{-3kwd^4}{t^4}$

$\Delta y = \frac{dy}{dw} \cdot \Delta w + \frac{dy}{dd} \cdot \Delta d + \frac{dy}{dt} \cdot \Delta t$

$\Delta y = \frac{kd^4}{t^3} \cdot \frac{3}{100} w + \frac{4kwd^3}{t^3} \cdot \frac{2.5}{100} d - \frac{3kwd^4}{t^3} \cdot \frac{4}{100} t$.