التاريخ:

موضوع الدرس:

$$\frac{dx}{dt} = \dot{x} = V\cos(\theta) \longrightarrow (1)$$

$$\frac{dy}{dt} = \dot{y} = V\sin(\theta) \longrightarrow (2)$$

given

$$\frac{d\theta}{dt} = \dot{\theta} = \omega \longrightarrow (3)$$

$$x_p = x + L\cos(\theta) \longrightarrow (4)$$

$$y_p = y + L\sin(\theta) \longrightarrow (5)$$

$$X(t) = 10\cos\left(\frac{\pi t}{5}\right) + 5\sin\left(\frac{\pi t}{10}\right) \longrightarrow (6)$$

$$Y(t) = 10\sin\left(\frac{\pi t}{10}\right) - 5\cos\left(\frac{\pi t}{10}\right) + 5 \longrightarrow (7)$$

$$\frac{dX(t)}{dt} = \dot{x} = -2\pi\sin\left(\frac{\pi t}{5}\right) + \frac{\pi}{2}\cos\left(\frac{\pi t}{10}\right) \longrightarrow (8)$$

$$\frac{dy(t)}{dt} = \dot{y} = \pi\cos\left(\frac{\pi t}{10}\right) + \frac{\pi}{2}\sin\left(\frac{\pi t}{10}\right) \longrightarrow (9)$$

$$\boxed{V = \frac{\dot{x}}{\cos(\theta)}} \longrightarrow (10)$$

$$V = \frac{\dot{y}}{\sin(\theta)} \longrightarrow (11)$$

$$\theta(t) = \tan^{-1}\left(\frac{2\cos\left(\frac{\pi t}{10}\right) + \sin\left(\frac{\pi t}{10}\right)}{-4\sin\left(\frac{\pi t}{5}\right) + \cos\left(\frac{\pi t}{10}\right)}\right) \longrightarrow (12)$$

$$\omega = \frac{\frac{\pi}{10} + \frac{\pi}{5}\sin\left(\frac{3\pi t}{10}\right) + \frac{2\pi}{10}\sin\left(\frac{\pi t}{10}\right) + \cos\left(\frac{\pi t}{10}\right) + \frac{\pi}{10}\cos\left(\frac{3\pi t}{10}\right) + \frac{\pi}{10}\cos\left(\frac{\pi t}{10}\right)}{11 + 2\cos\left(\frac{2\pi t}{10}\right) + 2\sin\left(\frac{2\pi t}{10}\right) - 8\cos\left(\frac{4\pi t}{10}\right) - 4\sin\left(\frac{3\pi t}{10}\right) - 4\sin\left(\frac{\pi t}{10}\right)}$$