

FAN IS TURNED ON.

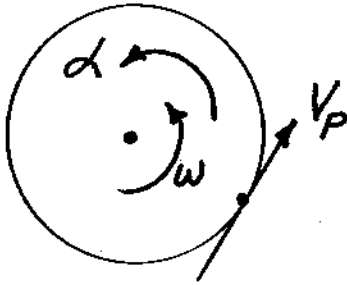
MOTOR GIVES BLADE
ANG. ACC. $\alpha = 20e^{-0.6t} \frac{\text{rad}}{\text{s}^2}$

? FIND SPEED OF pt. P AT $t = 3\text{s}$

DETERMINE NUMBER OF REVOLUTIONS
DURING THESE 3 SEC.

INITIALLY AT REST

$$\theta_i = \omega_i = \alpha_i = 0$$



$$\alpha = \frac{d\omega}{dt}$$

$$\int_0^t \alpha dt = \int_0^{\omega_f} d\omega$$

$$\int_0^t 20e^{-0.6t} dt = \omega_f - \omega_0$$

$$-\frac{1}{0.6} (20e^{-0.6t}) \Big|_0^t = \omega_f = -33.33e^{-0.6t} + 33.33$$

for $t = 3\text{sec}$, $-5.51 - (-33.33) = \omega_f = 27.823 \frac{\text{rad}}{\text{s}}$

and $\omega = \frac{d\theta}{dt}$ $\therefore \omega dt = d\theta$ USE GENERAL EXPRESSION

$$33.33 \int_0^t (-e^{-0.6t} + 1) dt = \int_0^{\theta_f} d\theta = 33.33 \left[\frac{1}{0.6} e^{-0.6t} + t \right]_0^3$$

$$33.33 [0.275 - 1.667 + 3] = \theta_f = 53.595 \text{ rad.}$$

$$\theta_f = 53.595 \text{ radians} \times \frac{1 \text{ rev}}{2\pi \text{ rad.}}$$

$$\theta = 8.53 \text{ revolutions}$$

$$V_P = r\omega = 1.75' (27.823 \frac{\text{rad}}{\text{s}}) = 48.69 \frac{\text{ft}}{\text{s}} = V_P$$

"PLUG-N-CHUG" IS OF NO VALUE HERE.