$$v = 35 \text{ ft/s}$$

$$r = \frac{200}{\theta} \qquad \dot{r} = -\frac{200}{\theta^2}\dot{\theta}$$

$$\theta = \frac{\pi}{3}$$

$$V = \sqrt{V_r^2 + V_\theta^2} = 35$$

$$35 = \sqrt{\left(-\frac{200}{\theta^2}\dot{\theta}\right)^2 + \left(\frac{200}{\theta}\dot{\theta}\right)^2}$$

$$35^2 = \frac{200^2\dot{\theta}^2}{\theta^4} + \frac{200^2\theta^2\dot{\theta}^2}{\theta^4}$$

$$\dot{\theta}^2\left(\frac{200^2 + 200^2\theta^2}{\theta^4}\right) = 35^2$$

$$\dot{\theta} = \sqrt{35^2 / (\quad)}$$

$$V_r = \dot{r} = \frac{-200}{\theta^2}\sqrt{35^2/(\quad)}$$

$$V_\theta = r\dot{\theta} = \left(\frac{200}{\theta}\right)\left(\sqrt{35^2/(\quad)}\right)$$