Problem 2

An 8 cm diamter hard drive platter is rotating at a constant rate of 3600 rpm. What is the velocity of a point on the outer edge of the platter? What is the acceleration experienced by a point on the edge of the platter?

$$3600 \text{ rpm} \rightarrow 376.991 \text{ rad/s}$$

$$V = r\omega\,\hat{U}_\theta \rightarrow (.04\text{m})(376.991 \text{ rad/s})\,\hat{U}_\theta$$

$$\boxed{V = 15.08 \text{ m/s}\,\hat{U}_\theta}$$

$$a = -r\omega^2\hat{U}_r + r\ddot{\theta}\hat{U}_\theta = -(.04\text{m})(376.991\text{rad/s})^2 + \cancel{(.04\text{m})(0)\hat{U}_\theta}$$

$$\boxed{a = -5684.9 \frac{\text{m}}{\text{s}^2}\,\hat{U}_r}$$