

19. The magnitude of the acceleration is given by $a = \omega^2 r$ (Eq. 11-23) where r is the distance from the center of rotation and ω is the angular velocity. We convert the given angular velocity to rad/s:

$$\omega = \frac{(33.33 \text{ rev/min})(2\pi \text{ rad/rev})}{60 \text{ s/min}} = 3.49 \text{ rad/s} .$$

Therefore,

$$a = \left(3.49 \text{ rad/s}^2 \right)^2 (0.15 \text{ m}) = 1.8 \text{ m/s}^2 .$$

The acceleration vector is toward the center of the record.