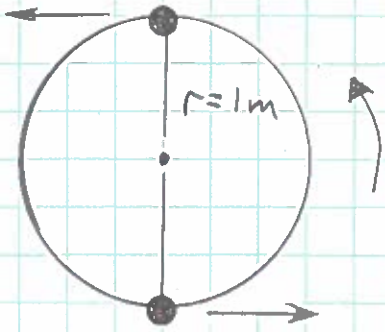

$\omega = 100 \text{ rpm} \cdot \left(\frac{2\pi \text{ rad}}{1 \text{ rev}}\right)\left(\frac{1 \text{ min}}{60 \text{ s}}\right)$

$\omega = 10.47 \text{ rad/s}$

$f_o = 620 \text{ Hz}$

Linear speed, $v_s = r\omega = 10.47 \text{ m/s}$

Speed of Sound, $v = 343 \text{ m/s}$

at top, source is approaching:

$$f_+ = f_o\left(\frac{v}{v - v_s}\right) = \underline{639.5 \text{ Hz}}$$

at bottom, source is receding:

$$f_- = f_o\left(\frac{v}{v + v_s}\right) = \underline{601.6 \text{ Hz}}$$