

$$F = qBv \sin 90^\circ = qvB$$

$$\frac{mv^2}{R} = evB \gg \frac{mv}{R} = eB \gg R = \frac{mv}{eB}$$

$$T = \frac{2\pi R}{v} = \frac{2\pi m}{eB} \gg v = \frac{1}{T} = \frac{eB}{2\pi m} \gg \frac{e}{m} = \frac{2\pi v}{B}$$

$$\text{Answer: } \frac{e}{m} = \frac{2\pi v}{B}$$