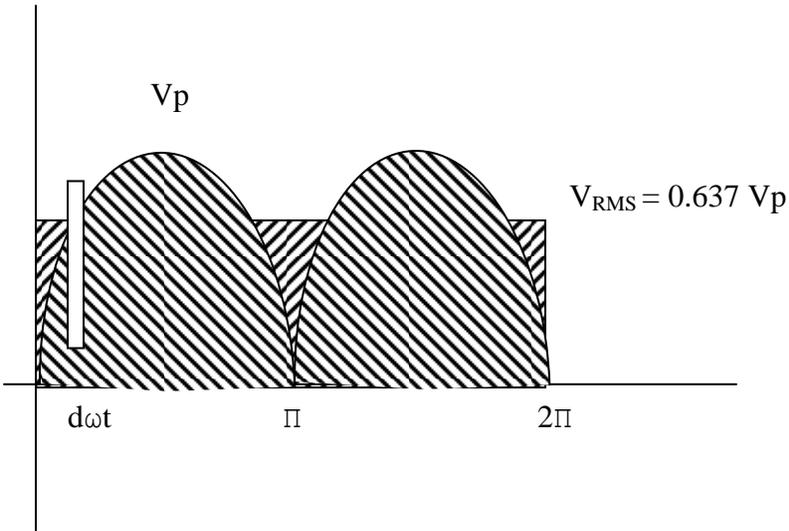


## FULL-WAVE RECTIFIER OUTPUT



The voltage equation is:

$$V = V_m \sin \omega t$$

There are two sine waves present in one cycle (the second being the negative half cycle rectified.) To get the RMS voltage, we need to know the shaded area and divide by the cycles that it appears above the zero line ( $2\pi$ ), thereby getting the “root mean square” RMS.

$$V_{RMS} = \frac{2 \times \int_0^{2\pi} (V_m \sin \omega t) \times d\omega t}{2\pi}$$

Take the constants out:

$$V_{RMS} = \frac{V_m}{\pi} \int_0^{2\pi} \sin \omega t \, d\omega t$$

We get:

$$V_{RMS} = \frac{V_m}{\pi} \left[ -\cos(2\pi) + \cos(0) \right]$$

Or:

$$V_{RMS} = \frac{V_m}{\pi} \left[ -(-1) + (1) \right]$$

$$V_{RMS} = \frac{2V_m}{\pi} = 0.637 \times V_m$$