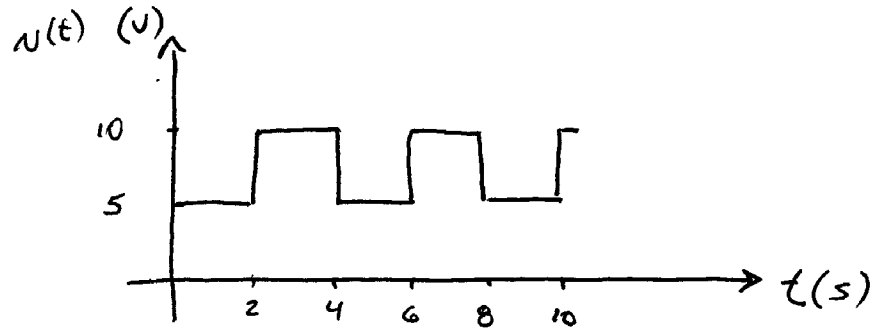
GIVEN:



FIND: V_{RMS}

SOLN: 1. DETERMINE THE PERIOD T

$T = 4s$ ~ WAVE FORM COMPLETES ONE CYCLE THEN REPEATS AFTER 4S

2. WRITE EQUATION(S) FOR $v(t)$ IN ONE PERIOD,

$$v(t) = \underset{\text{FROM } t=0\to4}{5} + \underset{\text{FROM } t=2\to4}{5}$$

3. COMPUTE RMS:

$$V_{RMS} = \sqrt{\frac{1}{4}\left[\int_0^4 (5)^2 dt + \int_2^4 (5)^2 dt\right]}$$

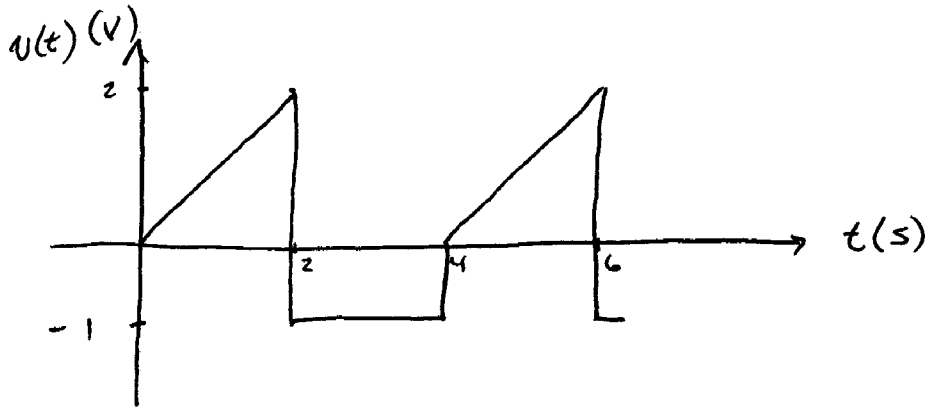
$$= \sqrt{\frac{1}{4}\left[25t\Big|_0^4 + 25t\Big|_2^4\right]}$$

$$= \sqrt{\frac{1}{4}(150)}$$

$$= \underline{6.124\ V_{RMS}}$$

TOPS 35510 - 100 sheets 35520 - 200 sheets

GIVEN:



FIND: V_{RMS}

SOLN: $T = 4\ s$

$$v(t) = \underset{\text{From } 0 \to 2}{1t} + \underset{\text{From } 2 \to 4}{-1}$$

$$V_{RMS} = \sqrt{\frac{1}{4}\int_0^2 (t)^2\,dt + \int_2^4 (-1)^2\,dt}$$

$$= \sqrt{\frac{1}{4}\left(\frac{t^3}{3}\right)\Big|_0^2 + 1\Big|_2^4}$$

$$= \sqrt{\frac{1}{4}\left(\frac{8}{3} + 2\right)}$$

$$= \underline{1.08\ V_{RMS}}$$

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GIVEN: $v(t) = 5\sin(t) + 4\cos(t)$ V

FIND: V_{Rms}

SOLN:

$$V_{Rms} = \sqrt{\frac{1}{2\pi}\left[\int_0^{2\pi}[5\sin(t)]^2 dt + \int_0^{2\pi}[4\cos(t)]^2 dt\right]}$$

$$= \sqrt{\frac{1}{2\pi}\left[\frac{25}{2}\left(t - \sin(t)\cos(t)\right)\Big|_0^{2\pi} + \frac{16}{2}\left(t + \sin(t)\cos(t)\right)\Big|_0^{2\pi}\right]}$$

$$= \sqrt{\frac{1}{2\pi}\left[(2\pi)\left(\frac{25}{2} + \frac{16}{2}\right)\right]}$$

$$= \underline{4.528 \text{ V}_{Rms}}$$

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