

ECE 2210 / 00 homework AC

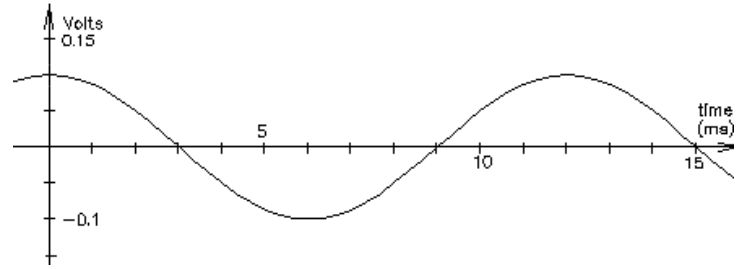
Due: Wed, 9/20/23

A. Stolp 2/6/00, 9/13/05
1/27/13, 9/9/23

1. For each of the following sinusoidal waves, find:

- 1) peak-to-peak voltage or current, V_{pp} or I_{pp}
- 2) amplitude, A , V_p , or I_p
- 3) period, T
- 4) frequency, f in cycles/sec or Hz
- 5) an expression for $v(t)$ or $i(t)$ in terms of $A\cos(\omega t + \phi)$
the frequency ω is in radians/sec
the phase angle ϕ is in rad/sec or degrees

a)



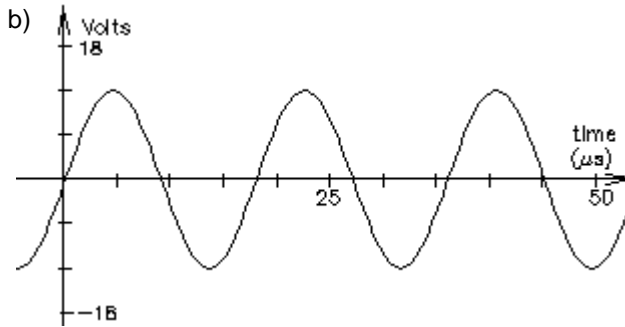
1) V_{pp} or I_{pp}

2) amplitude, A , V_p , or I_p

3) period, T

4) frequency, f in Hz

5) $v(t)$ in terms of $A\cos(\omega t + \phi)$



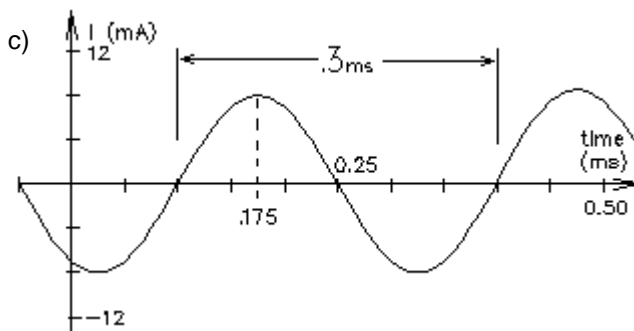
1) V_{pp}

2) V_p

3) T

4) f

5) $v(t)$



1) I_{pp}

2) I_p

3) T

4) f

5) $i(t)$

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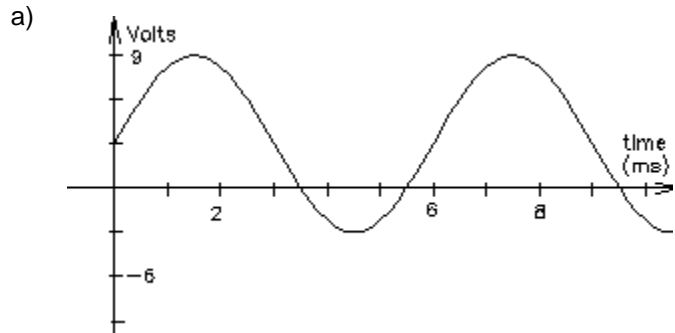
2. For each of the following waveforms, find:

- 1) Peak-to-peak voltage or current, V_{pp} or I_{pp}
- 2) Average, (V_C , I_{DC} , V_{ave} , or I_{ave})
- 3) Period, T
- 4) Frequency f in cycles/sec or Hz

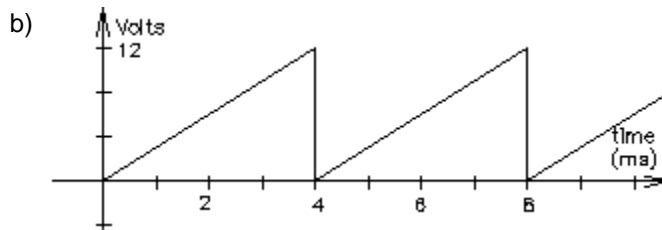
a) 1) V_{pp}

2) V_{DC}

3) T



4) f

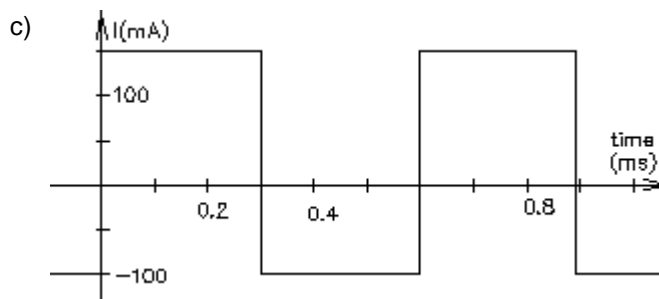


1) V_{pp}

2) V_{DC}

3) T

4) f



1) I_{pp}

2) I_{DC}

3) T

4) f

3. For problem 2a above, write a full expression for $v(t)$ in terms of $v(t) = A\cos(\omega t + \phi) + V_{DC}$

Answers

1. a) 0.2-V 0.1-V 12-ms 83.3-Hz $0.1 \cdot V \cdot \cos(523.6 \cdot t)$

b) 24-V 12-V 0.018-ms 55.6-kHz

$$v(t) := 12 \cdot V \cdot \cos(349100 \cdot t - 90 \cdot \text{deg})$$

c) 16-mA 8-mA 0.3-ms 3333-Hz

$$8 \cdot \text{mA} \cdot \cos(20940 \cdot t + 150 \cdot \text{deg})$$

2. a) 12-V 3-V 6-ms 167-Hz

b) 12-V 6-V 4-ms 250-Hz

c) 250-mA 25-mA 0.6-ms 1.667-kHz

3. $v(t) := 6 \cdot V \cdot \cos(1047 \cdot t - 90 \cdot \text{deg}) + 3 \cdot V$