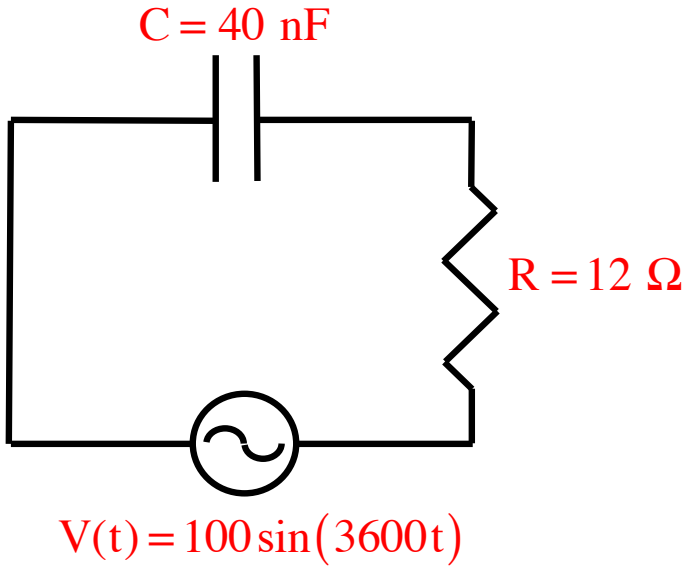
1.) RC circuit:

Consider the RC circuit shown to the right.

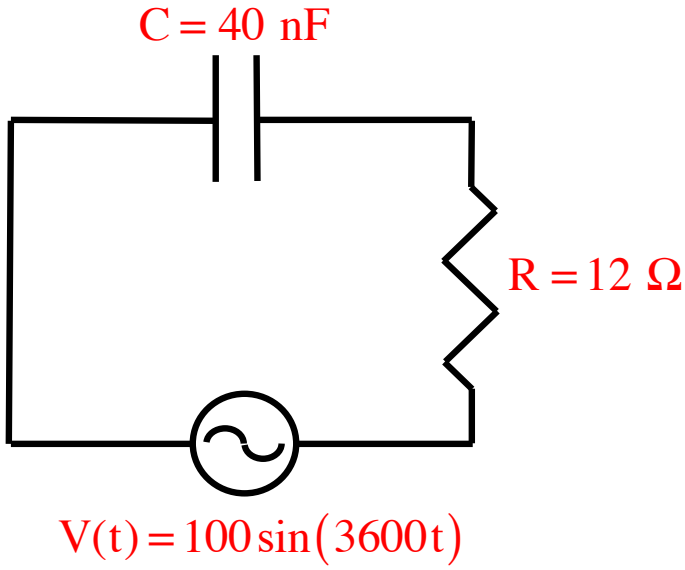


a.) What is the RMS value of the power supply?

b.) At what frequency is the power supply acting?

c.) What is the circuit's capacitive reactance?

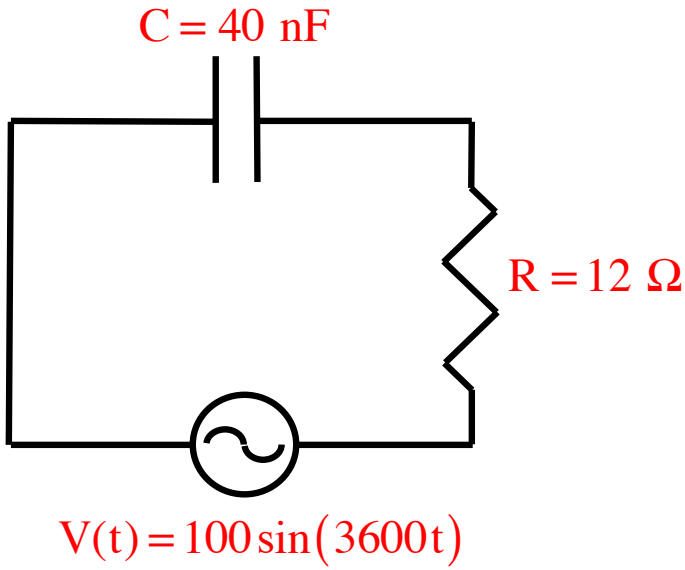
1.) RC circuit (con't) :



d.) What is the circuit's impedance?

e.) What is the circuit's current?

1.) RC circuit:



Consider the RC circuit shown to the right.

a.) What is the RMS value of the power supply?

$$V_{RMS} = .707V_o$$
$$= .707(100 \text{ volts})$$
$$= 70.7 \text{ volts}$$

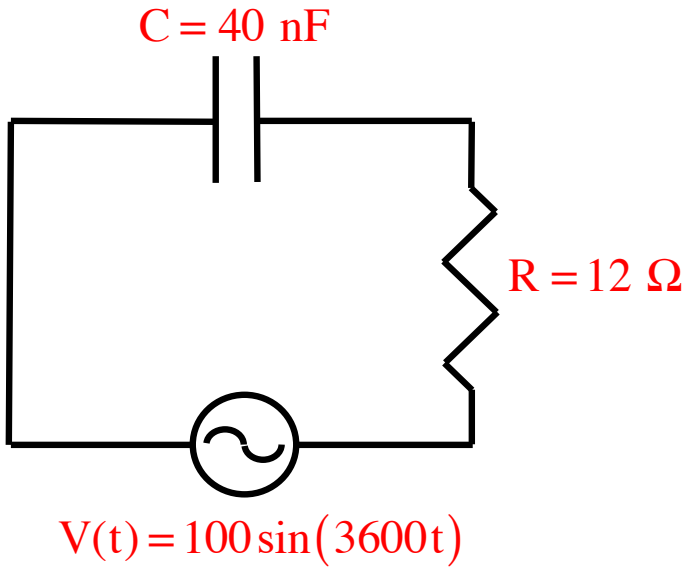
b.) At what frequency is the power supply acting?

$$2\pi\nu = 3600$$
$$= 573 \text{ Hz}$$

c.) What is the circuit's capacitive reactance?

$$X_C = \frac{1}{2\pi\nu C}$$
$$= \frac{1}{2\pi(573 \text{ Hz})(40x10^{-9} \text{ F})}$$
$$= 6.94x10^3 \ \Omega$$

1.) RC circuit (con't) :



d.) What is the circuit's impedance?

$$Z = \left[\left(R + \cancel{r_L}^{0}\right)^2 + \left(X_L - X_C\right)^2 \right]^{1/2}$$

$$= \left[\left(12\ \Omega + 0\right)^2 + \left(-6.94\text{x}10^3\right)^2 \right]^{1/2}$$

$$= 6.94\text{x}10^3\ \Omega$$

e.) What is the circuit's current?

$$i_{RMS} = \frac{V_{RMS}}{Z}$$

$$= \frac{(70.7\ \text{V})}{\left(6.94\text{x}10^3\ \Omega\right)}$$

$$= 1.02\text{x}10^{-2}\ \text{A}$$