

**Answer on question # 51504, Physics, Electromagnetism**

**Question** An ac circuit consists of a voltage source  $V = 200 \sin 120\pi t$  and a  $6\mu\text{F}$  capacitor in series. Calculate the current established in the circuit

**Solution** Current is related to voltage as

$$I = C \cdot V'(t) = C \cdot 200 \cdot 120\pi \cos 120\pi t = 6 \cdot 10^{-6} \cdot 200 \cdot 120\pi \cos 120\pi t = 0.144 \cos 120\pi t \text{ A}$$