Electrical Engineering

Practice exercises Solutions:

1. The voltage in a series circuit is 5 + 10i volts and the impedance is 1+2i ohms, what is the current?

   V = 5 + 10i volts
   Z = 1 + 2i ohms
   V = I x Z
   I = V / Z = $\frac{(5+10i)}{(1+2i)}$

   $$I = \frac{(5+10i)}{(1+2i)} \times \frac{(1-2i)}{(1-2i)}$$

   $$I = \frac{(5-10i+10i-20i^2)}{(1-2i+2i-4i^2)}$$

   $$I = \frac{(5+20)}{(1+4)}$$

   $$I = \frac{25}{5} = 5 \text{ amps}$$

2. If the current in a series circuit is 9-4i amps and the impedance is 3+4i ohms, what is the voltage?

   I = 9 - 4i amps
   Z = 3 + 4i ohms
   V = I x Z
   V = (9 - 4i) x (3 + 4i)
   V = (27 + 36i -12i – 16i^2) = (27 + 24i + 16)
   V = 43 + 24i volts