

$$V = 10V \quad I = ?$$

$$R = 4.6 \Omega$$

$$I = \frac{V}{R} = \frac{10V}{4.6 \Omega} = 2.2$$

Amps or  $\frac{V}{\Omega}$

$$V = IR$$

$$I = \frac{V}{R}$$

- 10) .5A  
15)  $30 \Omega, 4.72 \times 10^{-4} \Omega \cdot m$

17.3 p537

$$I = 6.4A$$

$$V = 120V$$

$$R = ?$$

$$V = IR$$

$$R = \frac{V}{I} = \frac{120}{6.4} = 19 \Omega$$

V voltage Volts V  
I current Amps A  
R resistance Ohms  $\Omega$

Ohm's Law  $V = I \cdot R$

Ex 17.4 p 539

$$\frac{R}{l} = ? \quad \begin{array}{l} 22 \text{ gauge} \\ \text{nichrome} \end{array}$$

$$r = .321 \text{ mm} = .321 \times 10^{-3} \text{ m}$$



$$\rho = 150 \times 10^{-8} \Omega \cdot m$$

$$A = \pi r^2$$

$$= \pi (.321 \times 10^{-3})^2$$

$$A = 3.24 \times 10^{-7} \text{ m}^2$$

$$R = \frac{\rho l}{A} = \rho \frac{l}{A} = \frac{\rho}{\pi r^2} l$$

$$\Omega = \frac{\Omega \cdot m \cdot m}{m^2}$$

cross-section Area - circle

$$A = \pi r^2$$

$\div$  both sides by  $l$

find A

$$= \pi r^2$$

change mm  $\rightarrow$  m

$$\div 1000$$

$$\frac{R}{l} = \frac{\rho}{A} = \frac{150 \times 10^{-8} \Omega \cdot m}{3.24 \times 10^{-7} \text{ m}^2} = 4.6 \frac{\Omega}{m}$$

plug in + solve

if  $10V, 1m, I = ?$

$$\rho = 150 \times 10^{-8} \Omega \cdot m$$

$$A = 3.24 \times 10^{-7} \text{ m}^2$$

$$l = 1m$$

17.3 p537

I = 6.4 A

V = 120 V

R = ?

V = IR

R = V/I = 120/6.4 = 19 Ω

V voltage Volts V  
I current Amps A  
R resistance Ohms Ω

Ohm's Law V = I · R

Ex 17.4 p 539

R = ? 22 gauge  
l nichrome

r = .321 mm  
= 3.21 x 10<sup>-4</sup> m



ρ = 150 x 10<sup>-8</sup> Ω · m

A = πr<sup>2</sup>

= π(3.21 x 10<sup>-4</sup>)<sup>2</sup>

A = 3.24 x 10<sup>-7</sup> m<sup>2</sup>

R = ρl/A = ρl/πr<sup>2</sup>

Ω = Ω · m · m

cross-section Area - circle

A = πr<sup>2</sup>

÷ both sides by l

find A

= πr<sup>2</sup>

change mm → m

÷ 1000

R/l = ρ/A = 150 x 10<sup>-8</sup> Ω · m / 3.24 x 10<sup>-7</sup> m<sup>2</sup> = 4.6 Ω/m

plug in + solve

if 10 V, 1 m, I = ?

ρ = 150 x 10<sup>-8</sup> Ω · m  
A = 3.24 x 10<sup>-7</sup> m<sup>2</sup>  
l = 1 m