Physics 30 – Lesson 18
Electric Current

1)

$$I = \frac{q}{r}$$

/3 $\quad I = \dfrac{900C}{1.5\min(60\,{}^{s}\!/_{\min})}$

$$\boxed{I = 10A}$$

2)

$$q = It$$

/3 $\quad q = 0.80A(20\min)(60\,{}^{s}\!/_{\min})$

$$\boxed{q = 9.60 \times 10^{2}C}$$

3) $\quad q = 1.25 \times 10^{10}\,e^{-} \times 1.60 \times 10^{-19}\,\frac{c}{e^{-}}$ $\qquad I = \dfrac{q}{t}$

/3 $\quad q = 2.0 \times 10^{-9}C$

$$I = \frac{2.0 \times 10^{-9}C}{0.50s}$$

$$\boxed{I = 4.0 \times 10^{-9}A}$$

4)

$$t = \frac{q}{I}$$

/3 $\quad t = \dfrac{8.0C}{0.40A}$

$$\boxed{t = 20s}$$

5)
$\quad q = It$ $\qquad\qquad\qquad n_{e^{-}} = \dfrac{q}{e^{-}}$

/3 $\quad q = 0.50A(1s)$

$\quad q = 0.50C$ $\qquad\qquad\quad n_{e^{-}} = \dfrac{0.50C}{1.60 \times 10^{-19}C/e^{-}}$

$$\boxed{n_{e^{-}} = 3.1 \times 10^{18}\,e^{-}}$$

6)

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

/3 $\quad R = \dfrac{9.0V}{0.025A}$

$$\boxed{R = 360\Omega}$$

7)

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

/3 $$I = \frac{230V}{9.2\Omega}$$

$$\boxed{I = 25A}$$

8)

$$V = IR$$

/3 $$V = (160 \times 10^{-3} A)(5.0 \times 10^4 \Omega)$$

$$\boxed{V = 8.0 \times 10^3 V}$$

9)

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

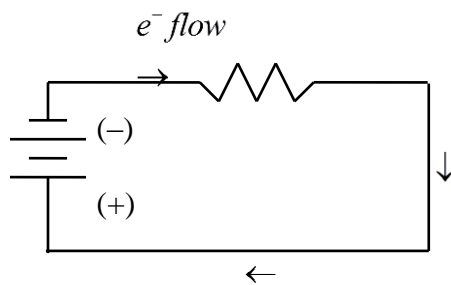/3 $$I = \frac{120V}{12\Omega}$$

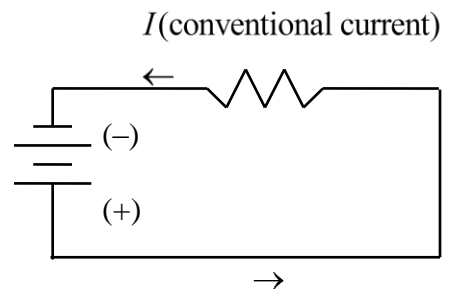$$\boxed{I = 10A}$$

10)

$$V = IR$$

/3 $$V = (8.0A)(64\Omega)$$

$$\boxed{V = 5.1 \times 10^2 V}$$

11)

/3

$e^-\ flow$ I(conventional current)

(−) electrons flow from (−) to (+)   (+) conventional current flows from (+) to (−)