

Algebraic Manipulation (27:39)

Evaluate the expression $I = \frac{V}{R}$ given $R = 240\Omega$ and $V = 14.3V$. Express the answer using proper engineering format rounded to the tenths place.

Given $I = \frac{V}{R}$ solve for unknown V given known R and I values.

Given $I = \frac{V}{R}$ solve for unknown R given known V and I values.

Given $P = VI$ solve for unknown V given known P and I values.

Given $P = VI$ solve for unknown I given known P and V values.

Solve for the indicated unknown quantities using the indicated known quantities.

| | | |
|-------------------|---------|---|
| $V = IR$ | KNOWN | V |
| | KNOWN | P |
| | UNKNOWN | R |
| $I = \frac{V}{R}$ | KNOWN | I |
| | KNOWN | P |
| | UNKNOWN | R |
| $R = \frac{V}{I}$ | KNOWN | P |
| | KNOWN | R |
| | UNKNOWN | I |
| $P = VI$ | KNOWN | P |
| | KNOWN | R |
| | UNKNOWN | I |
| $V = \frac{P}{I}$ | KNOWN | P |
| | KNOWN | R |
| | UNKNOWN | I |
| $I = \frac{P}{V}$ | KNOWN | P |
| | KNOWN | R |
| | UNKNOWN | V |
| $P = \frac{V}{R}$ | KNOWN | P |
| | KNOWN | R |
| | UNKNOWN | V |
| $P = I^2 R$ | | |

Solve for the indicated unknown quantities using the indicated known quantities.

$$P_{MECH} = \frac{T \cdot n}{9.55}$$

① KNOWN P_{MECH}
KNOWN n
UNKNOWN T

② KNOWN P_{MECH}
KNOWN T
UNKNOWN n

$$EFFICIENCY = \frac{P_{OUT}}{P_{IN}}$$

③ KNOWN EFFICIENCY
KNOWN P_{IN}
UNKNOWN P_{OUT}

④ KNOWN EFFICIENCY
KNOWN P_{OUT}
UNKNOWN P_{IN}

$$\frac{T_1}{T_2} = \frac{n_2}{n_1}$$

⑤ KNOWN T_1
KNOWN T_2
KNOWN n_1
UNKNOWN n_2


⑥ KNOWN T_1
KNOWN T_2
KNOWN n_2
UNKNOWN n_1

$$X_L = 2\pi f L$$

⑦ KNOWN X_L
KNOWN f
UNKNOWN L

$$X_C = \frac{1}{2\pi f C}$$

⑧ KNOWN X_C
KNOWN f
UNKNOWN C



$$A = \pi r^2$$

$$d = 2r$$

⑨ KNOWN d
UNKNOWN A

⑩ KNOWN A
UNKNOWN d

Identify practical applications for algebraic manipulation.