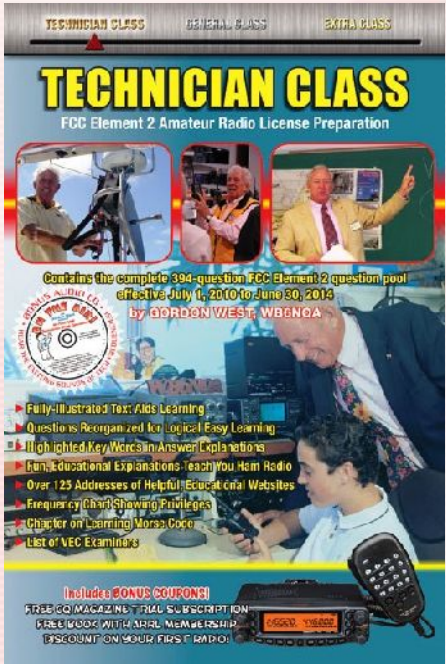
Technician Licensing Class

It’s the Law, per Mr. Ohm!

Presented by



Amateur Radio Technician Class
Element 2 Course Presentation

ELEMENT 2 SUB-ELEMENTS
(Groupings)

- **About Ham Radio**
- **Call Signs**
- **Control**
- **Mind the Rules**
- **Tech Frequencies**
- **Your First Radio**
- **Going On The Air!**
- **Repeaters**
- **Emergency!**
- **Weak Signal Propagation**

Amateur Radio Technician Class
Element 2 Course Presentation

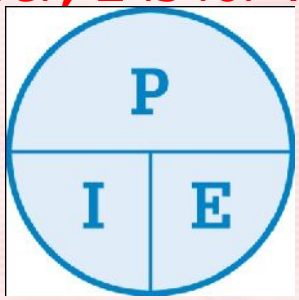
- **ELEMENT 2 SUB-ELEMENTS** (Groupings)
  - **Talk to Outer Space!**
  - **Your Computer Goes Ham Digital!**
  - **Multi-Mode Radio Excitement**
  - **Run Some Interference Protection**
  - **Electrons – Go With the Flow!**
  - **It's the Law, per Mr. Ohm!**
  - **Go Picture These!**
  - **Antennas**
  - **Feed Me with Some Good Coax!**
  - **Safety First!**

It’s the Law, per Mr. Ohm!

- T5A10 Power is the term that describes the rate at which electrical energy is used.
- T5A2 Electrical power is measured in watts.
  - The power meter outside is called ‘watt meter’
- T5C8 Power (P) equals voltage (E) multiplied by current (I) is the formula used to calculate electrical power in a DC circuit.
  - **P** is for power, **E** is for Voltage, and **I** is for current

The math is easy

Two known numbers are given, solve for the unknown



Cover up the unknown and plug the numbers in the other two

P = I x E

Finding Power

I = P / E

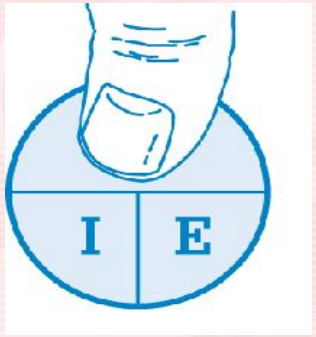
Finding Amperes

E = P / I

Finding Voltage

It’s the Law, per Mr. Ohm!

- T5C9 138 watts of power is being used in a circuit when the applied voltage is 13.8 volts DC and the current is 10 amperes.
  - Solving for “P” so cover up the P and plug in the other two numbers
  - **E** is given as 13.8 volts and **I** is given as 10 amperes



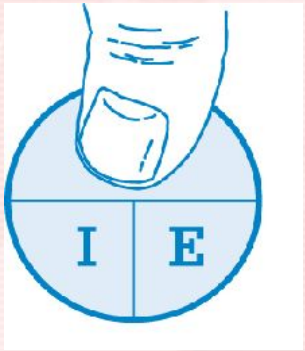
P = I x E

P = 10 x 13.8

P = 138 watts

It’s the Law, per Mr. Ohm!

- T5C10 30 watts of power is being used in a circuit when the applied voltage is 12 volts DC and the current is 2.5 amperes.
  - Solving for “P” so cover up the “P” and plug in the other two numbers
  - **E** is given as 12 volts and **I** is given as 2.5 amperes



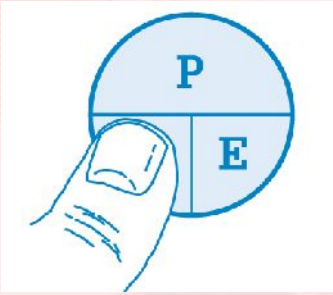
P = I x E

P = 2.5 x 12

P = 30 watts

It’s the Law, per Mr. Ohm!

- T5C11 10 amperes are flowing in a circuit when the applied voltage is 12 volts DC and the load is 120 watts.
  - Solving for “I” so cover up the “I” and plug in the other two numbers
  - **P** is given as 120 watts and **E** is given as 12 volts and



I = P / E

I = 120 / 12

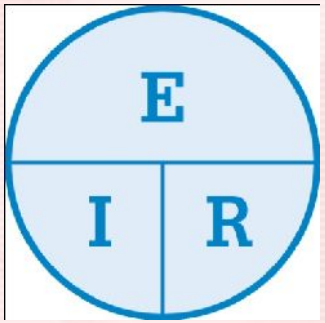
I = 10 Amperes

It’s the Law, per Mr. Ohm!

- T5D2 The formula **Voltage** (E) equals current (I) multiplied by resistance (R) is used to calculate voltage in a circuit.
  - **E** is for Voltage, **I** is for current, and **R** is for resistance

The math is easy

Two known numbers are given, solve for the unknown



Cover up the unknown and plug the numbers in the other two

E = I x R

Finding Voltage

I = E / R

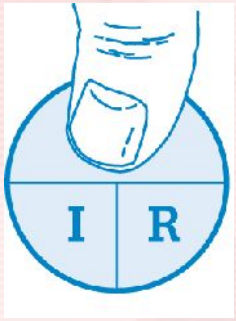
Finding Amperes

R= E / I

Finding Resistance

It’s the Law, per Mr. Ohm!

- T5D10 The voltage across a 2-ohm resistor if a current of 0.5 amperes flows through it is 1 volt.
  - Solving for “E” so cover up the “E” and plug in the other two numbers
  - **I** is given as 0.5 amperes and **R** is given as 2 ohms



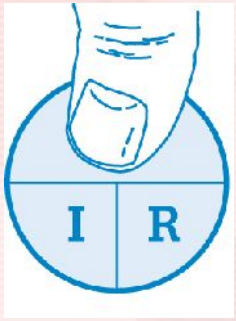
E = I x R

E = 0.5 x 2

E= 1 volt

It’s the Law, per Mr. Ohm!

- T5D11 The voltage across a 10-ohm resistor if a current of 1 amperes flows through it is 10 volts.
  - Solving for “E” so cover up the “E” and plug in the other two numbers
  - **I** is given as 1 ampere and **R** is given as 10 ohms



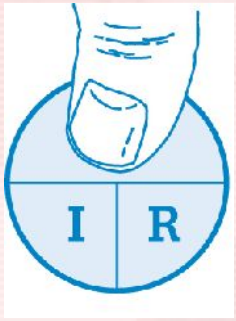
E = I x R

E = 1 x 10

E= 10 volts

It’s the Law, per Mr. Ohm!

- T5D12 The voltage across a 10-ohm resistor if a current of 2 amperes flows through it is 20 volts.
  - Solving for “E” so cover up the “E” and plug in the other two numbers
  - **I** is given as 1 ampere and **R** is given as 10 ohms



E = I x R

E = 2 x 10

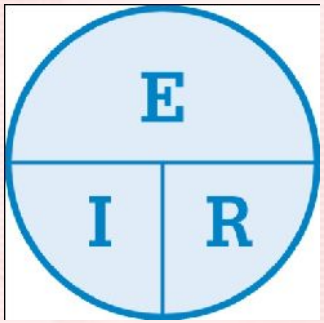
E= 20 volts

It’s the Law, per Mr. Ohm!

- T5D1 The formula **Current** (I) equals voltage (E) divided by resistance (R) is used to calculate current in a circuit.
  - **E** is for Voltage, **I** is for current, and **R** is for resistance

The math is easy

Two known numbers are given, solve for the unknown

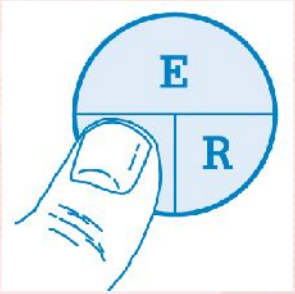


Cover up the unknown and plug the numbers in the other two

I = E / R	E = I x R	R= E / I
Finding Amperes	Finding Voltage	Finding Resistance

It’s the Law, per Mr. Ohm!

- T5D9 The current flowing through a 24-ohm resistor connected across 240 volts 10 amperes.
  - Solving for “I” so cover up the “I” and plug in the other two numbers
  - **E** is given as 240 volts and **R** is given as 24 ohms



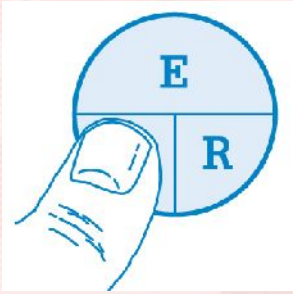
I = E / R

I = 240 / 24

I = 10 amperes

It’s the Law, per Mr. Ohm!

- T5D8 The current flowing through a 100-ohm resistor connected across 200 volts 2 amperes.
  - Solving for “I” so cover up the “I” and plug in the other two numbers
  - **E** is given as 200 volts and **R** is given as 100 ohms



I = E / R

I = 200 / 100

I = 2 amperes

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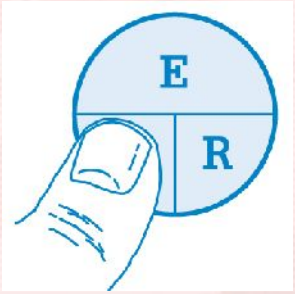
- T5D7 The current flow in a circuit with an applied voltage of 120 volts and a resistance of 80 ohms is 1.5 amperes.
  - Solving for “I” so cover up the “I” and plug in the other two numbers
  - **E** is given as 120 volts and **R** is given as 80 ohms



I = E / R

I = 120 / 80

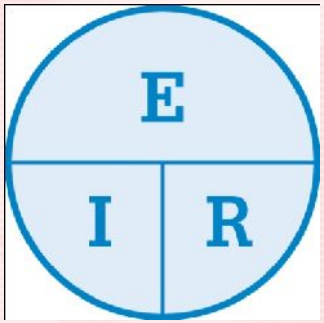
I = 1.5 amperes

It’s the Law, per Mr. Ohm!

- T5D3 The formula **Resistance** (R) equals voltage (E) divided by current (I) is used to calculate resistance in a circuit.
  - **E** is for Voltage, **I** is for current, and **R** is for resistance

The math is easy

Two known numbers are given, solve for the unknown



Cover up the unknown and plug the numbers in the other two

R= E / I

Finding Resistance

I = E / R

Finding Amperes

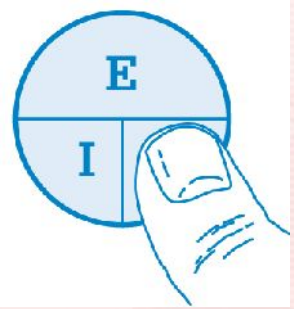
E = I x R

Finding Voltage

It’s the Law, per Mr. Ohm!

- T5D4 The resistance of a circuit in which a current of 3 amperes flows through a resistor connected to 90 volts is 30 ohms.

  - Solving for “R” so cover up the “R” and plug in the other two numbers
  - **E** is given as 90 volts and **I** is given as 3 amperes



R = E / I

R = 90 / 3

R = 30 ohms

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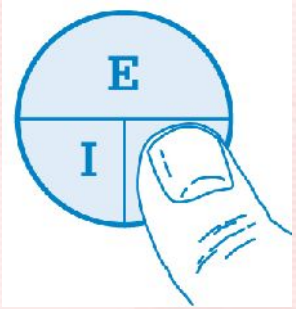
- T5D5 The resistance in a circuit for which the applied voltage is 12 volts and the current flow is 1.5 amperes is 8 ohms.
  - Solving for “R” so cover up the “R” and plug in the other two numbers
  - **E** is given as 12 volts and **I** is given as 1.5 amperes



R = E / I

R = 12 / 1.5

R = 8 ohms

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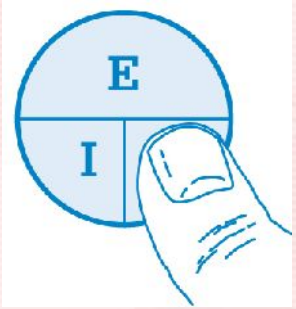
- T5D6 The resistance of a circuit that draws 4 amperes from a 12-volt source is 3 ohms.
  - Solving for “R” so cover up the “R” and plug in the other two numbers
  - **E** is given as 12 volts and **I** is given as 4 amperes



R = E / I

R = 12 / 4

R = 3 ohms

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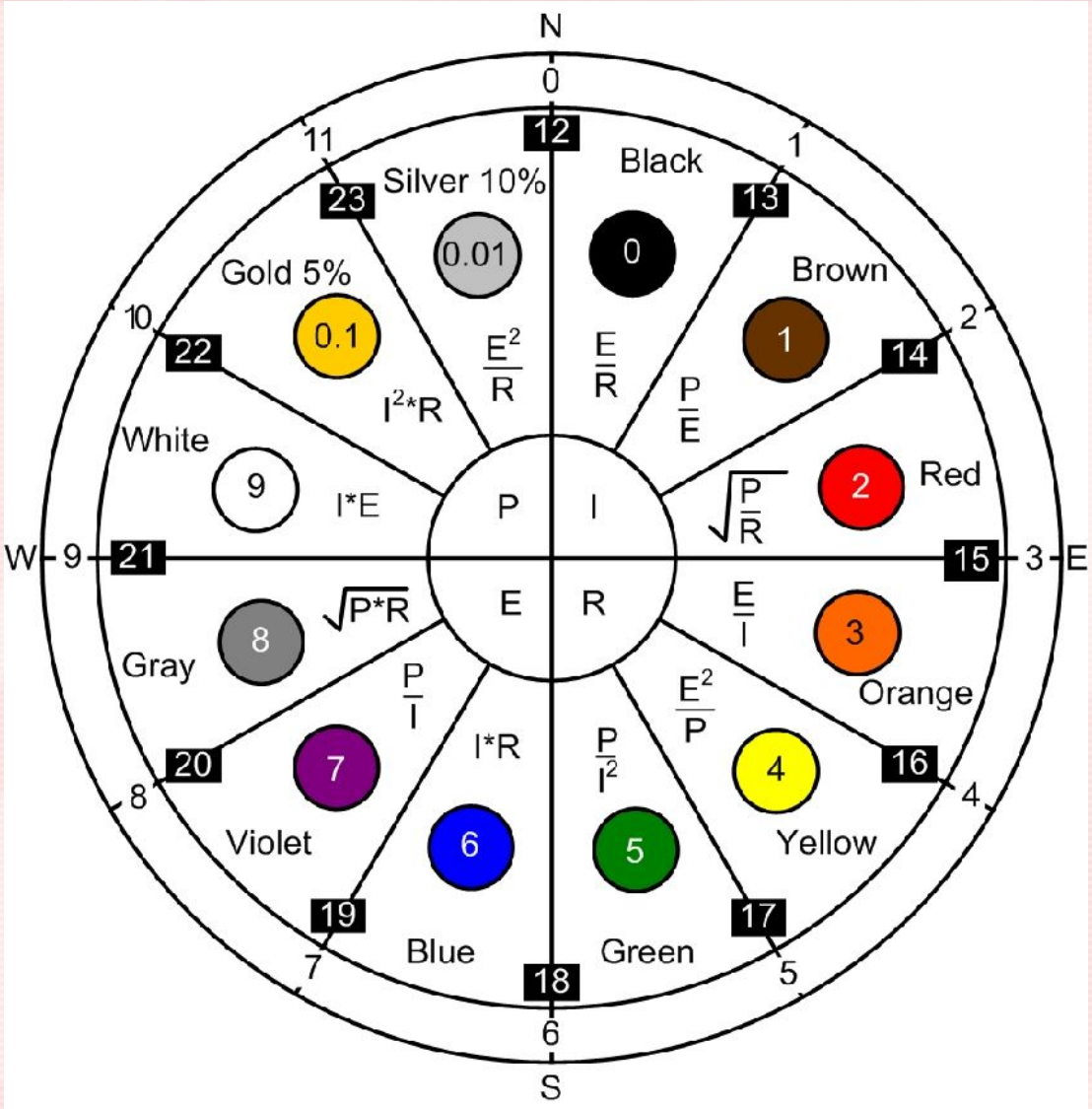


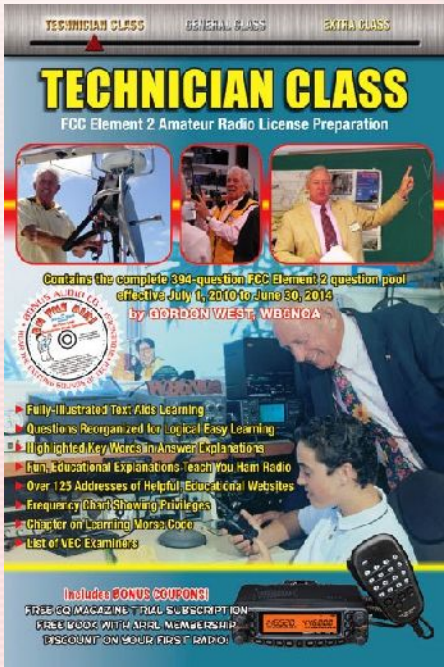
Element 2 Technician Class Question Pool

It’s the Law, per Mr. Ohm!

Valid July 1, 2010

Through

June 30, 2014



T5A10 Which term describes the rate at which electrical energy is used?

A. Resistance
B. Current
C. Power
D. Voltage

T5A02 Electrical power is measured in which of the following units?

A. Volts
B. Watts
C. Ohms
D. Amperes

T5C08 What is the formula used to calculate electrical power in a DC circuit?

A. Power (P) equals voltage (E) multiplied by current (I)

B. Power (P) equals voltage (E) divided by current (I)

C. Power (P) equals voltage (E) minus current (I)

D. Power (P) equals voltage (E) plus current (I)

T5C09 How much power is being used in a circuit when the applied voltage is 13.8 volts and the current is 10 amperes?
DC

A. 138 watts
B. 0.7 watts
C. 23.8 watts
D. 3.8 watts

T5C10 How much power is being used in a circuit when the applied voltage is 12 volts DC and the current is 2.5 amperes?

A. 4.8 watts
B. 30 watts
C. 14.5 watts
D. 0.208 watts

T5C11 How many amperes are flowing in a circuit when the applied voltage is 12 volts DC and the load is 120 watts?

A. 0.1 amperes
B. 10 amperes
C. 12 amperes
D. 132 amperes

T5D02 What formula is used to calculate voltage in a circuit?

A. Voltage (E) equals current (I) multiplied by resistance (R)

B. Voltage (E) equals current (I) divided by resistance (R)

C. Voltage (E) equals current (I) added to resistance (R)

D. Voltage (E) equals current (I) minus resistance (R)

T5D10 What is the voltage across a 2-ohm resistor if a current of 0.5 amperes flows through it?

A. 1 volt
B. 0.25 volts
C. 2.5 volts
D. 1.5 volts

T5D11 What is the voltage across a 10-ohm resistor if a current of 1 ampere flows through it?

A. 1 volt
B. 10 volts
C. 11 volts
D. 9 volts

T5D12 What is the voltage across a 10-ohm resistor if a current of 2 amperes flows through it?

A. 8 volts
B. 0.2 volts
C. 12 volts
D. 20 volts

T5D01 What formula is used to calculate current in a circuit?

A. Current (I) equals voltage (E) multiplied by resistance (R)

B. Current (I) equals voltage (E) divided by resistance (R)

C. Current (I) equals voltage (E) added to resistance (R)

D. Current (I) equals voltage (E) minus resistance (R)

T5D09 What is the current flowing through a 24-ohm resistor connected across 240 volts?

A. 24,000 amperes
B. 0.1 amperes
C. 10 amperes
D. 216 amperes

T5D08 What is the current flowing through a 100-ohm resistor connected across 200 volts?

A. 20,000 amperes
B. 0.5 amperes
C. 2 amperes
D. 100 amperes

T5D07 What is the current flow in an applied voltage of 120 volts and a resistance of 80 ohms?

A. 9600 amperes
B. 200 amperes
C. 0.667 amperes
D. 1.5 amperes

T5D03 What formula is used to calculate resistance in a circuit?

A. Resistance (R) equals voltage (E) multiplied by current (I)

B. Resistance (R) equals voltage (E) divided by current (I)

C. Resistance (R) equals voltage (E) added to current (I)

D. Resistance (R) equals voltage (E) minus current (I)

T6B04 What is the resistance of a circuit in which a current of 3 amperes flows through a resistor connected to 90 volts?

A. 3 ohms
B. 30 ohms
C. 93 ohms
D. 270 ohms

T5D05 What is the resistance in a circuit for which the applied voltage is 12 volts and the current flow is 1.5 amperes?

A. 18 ohms
B. 0.125 ohms
C. 8 ohms
D. 13.5 ohms

T5D06 What is the resistance of a circuit that draws 4 amperes from a 12-volt source?

A. 3 ohms
B. 16 ohms
C. 48 ohms
D. 8 ohms