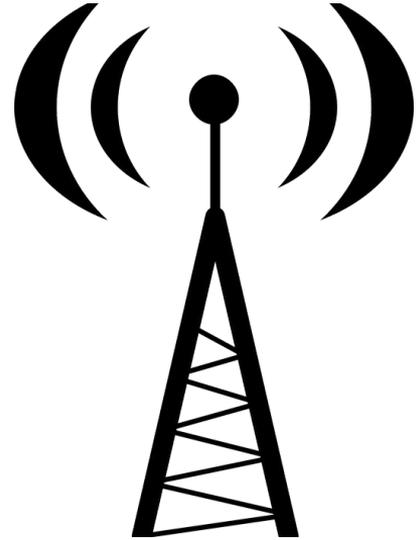




Electrical Engineer

What does an Electrical Engineer do?

Electrical engineers design, develop, test, and supervise the manufacture of electrical equipment such as electrical motors, wiring in buildings, and electronics.



Usage of Mathematics

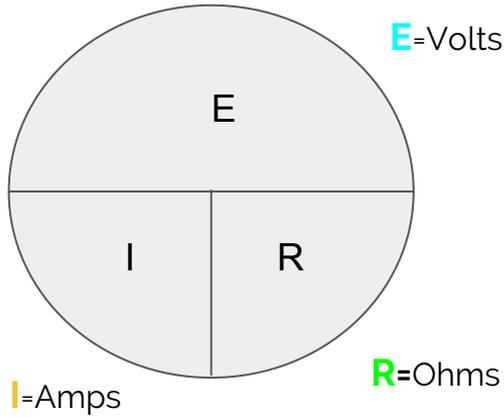


- Electrical Engineers use math when creating new circuits to avoid problems when manufacturing the product.
- Also, math helps Electrical Engineers predict and save time in finding the correct password in brute-force attack which is used to code electronics.
- Required Math:
 - ◆ College Algebra, Geometry, Trigonometry, Calculus I and II, Linear Algebra, Differential Equations, Statistics



Math Problem

Ohm's Law (Electrical Resistance): Predict the **Ohms** (resistance), **Amps** (the flow of electrons), and **Voltage** (pressure).



The circle is used to help memorize the equations. Multiplication and Division:

$$E/I = R \quad E/R = I \quad I \times R = E$$



Symbol for
Ohms



Math Problem

From the two diagram which one has the greatest resistance?

Diagram A

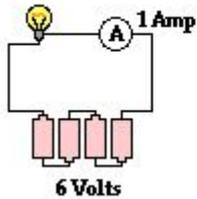


Diagram B

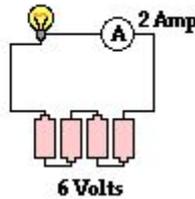


Diagram A

Given: Amps: 1 , Volts: 6

Find: Ohms (resistance)

Equation: $R = E / I$

$$E = 6 / 1 = 6$$

$$= 6 \Omega$$

Diagram B

Given: Amps: 2 , Volts: 6

Find: Ohms (resistance)

Equation: $R = E / I$

$$E = 6 / 2 = 3$$

$$= 3 \Omega$$

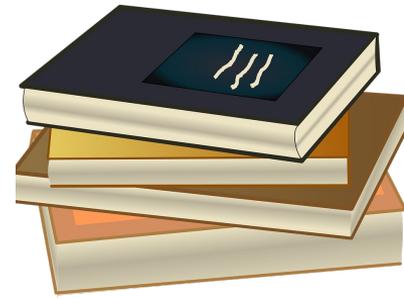
Diagram A has greater resistance.

Education

- **Bachelors:** A **four-year** electrical engineering degree prepares **students to design and analyze electrical systems**. Students will gain extensive **understanding of electrical theory** and **hands-on experience** with circuitry, mechanics, computer programming and thermodynamics. Students can **choose to specialize** in a related field.
- **Masters:** Graduate courses go far beyond the materials studied at the bachelor's level and are much **more challenging**. Graduate students typically **focus on one specific area of electrical engineering**, and must demonstrate their knowledge on that topic by completing a project or writing a **comprehensive thesis**. (**2 years**)
- **PhD** students spend much of their time completing a **research dissertation**, but are also responsible for taking **coursework in a designated specialization**. Many doctoral students teach courses to undergraduate students while earning their degree. (**3 to 8 years depending on specialization**)

Education

- All electrical engineers who work in the utility field must be licensed through the Fundamentals of Engineering (FE) exam.
- To qualify for the Professional Engineer (PE) exam, EITs must have four years of relevant work experience.
- Electrical engineering students may be able to **combine a bachelor's degree and master's degree with a five-year study program**. Electrical engineers who hold a master's degree can take jobs as an instructor at colleges and universities or research and development positions at a private firm.



Work Cited

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