

## Watt's Law

### Lesson 6

Remember:

**P**retty **P**lease **M**y **D**ear **A**unt **S**ally

(From left to right; **P**arentheses; **P**ower; **M**ultiply; **D**ivide; **A**dd, **S**ubtract)

Identify The Math, Math Terms, Vocabulary, Description Or Definitions

Remember lesson 5, Ohm's Law? The 15-amp fuse protecting the driving lamp circuit keep blowing. We did the math and found that a 30-amp fuse will protect the circuit. Now we need to find out what the Wattage rating of the lamps are.

When you change the incandescent bulb in the table lamp, how is it rated?

How is the intensity of your car's stereo system rated?

How is a microwave oven rated?.

What is a watt?

What does it measure?

Where does the name originate?

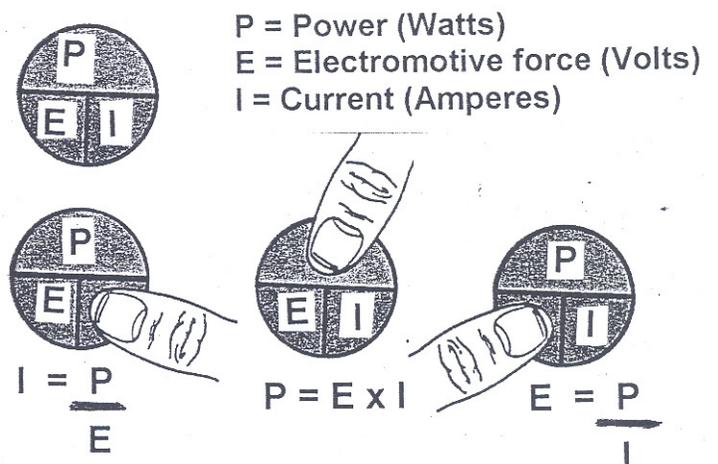
How is it calculated?

$$P = E \times I$$

P = Power (Watts)

E = Electromotive force (Volts)

I = Current (Amperes)



## Ohm's Law

$$E = I \times R$$

E = Voltage

$$I = \text{Amps}$$
$$R = \text{Ohms}$$

## Watt's Law

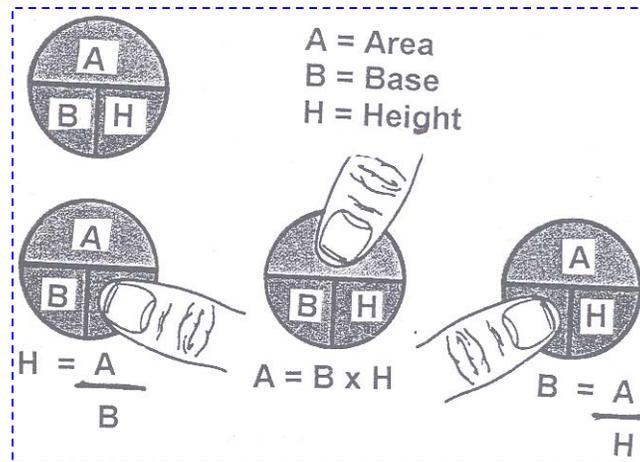
$$W (P) = E \times I$$

W (P) = Watts

$$E = \text{Voltage}$$
$$I = \text{Amps}$$

Let's find the wattage of our original problem: If E (Voltage) = 12 and I (Amperes) = 30, what is P (Power) equal to?

1. How many **watts** will 2 **halogen** bulbs produce if the **voltage** equals 12 and the **amperage** equals 70?
2. If a 500-watt speaker needs 10 **amps** to operate, what is the **voltage** requirement?
3. A 1250-**Watt** hair dryer operates on 110 **volts**. What is the amperage?



4. The formula for the area of a parallelogram is  $A = BH$  where  $A$  is the area,  $B$  is the length of the base and  $H$  is the height. Find the base of a parallelogram that has an area of 913.92 square inches and a height of 33.6 inches.
5. The formula for the perimeter (distance around) of a regular polygon is  $P = NS$  where  $P$  is the perimeter,  $N$  is the number of sides and  $S$  is the length of each side. Remember in a regular polygon, all sides are equal in length. What is the perimeter of a regular pentagon (5 sided figure) if the length of a side is 3.8 meters?
6. Use the following formula to solve this problem:  $x = yz$  where  $x = 16$  and  $z = 4$

**North Montco Technical Career Center**

**Math-In-CTE**

Lesson 6 Worksheet – Watt's Law

Name: \_\_\_\_\_ AM-1: \_\_\_\_\_ PM \_\_\_\_\_ Date: \_\_\_\_\_

1. A computer monitor uses 265 watts. The AC voltage is 120 V. How many amps are being used?

2. A 12-volt halogen bulb uses 4.17 amps. What watt model is this bulb?

3. A 450-watt car stereo amplifier operates on 12 volts. How many amps will this unit require?

4. The formula for the area of a parallelogram is  $A = BH$  where  $A$  is the area,  $B$  is the length of the base and  $H$  is the height. Find the height of a parallelogram that has a base of 24.3 meters and an area of 405.81 square meters.

5. The formula for the perimeter of a regular polygon is  $P = NS$  where  $P$  is the perimeter,  $N$  is the number of sides and  $S$  is the length of each side. Remember in a regular polygon, all sides are equal in length. If the perimeter of a regular polygon is 135.8 feet and the length of each side is 19.4 feet, how many sides does this polygon have?

6. Use the following formula to solve this problem:  $x = yz$ .

Solve for  $z$  if  $x = 318.24$  and  $y = 122.4$

## North Montco Technical Career Center

### Math-In-CTE

#### Lesson 6 Homework – Watt's Law

Name: \_\_\_\_\_ AM-1: \_\_\_\_\_ PM \_\_\_\_\_ Date: \_\_\_\_\_

1. In a 2057 bulb, the wattage is 26.9 W and 7.6 W. The voltage is 12.6 volts. What are the corresponding current values?

2. In a 1176 bulb, the voltage is 14.5 V and the currents are 1.34 A and 0.59 A. What are the corresponding wattages?

3. An Acme computer is rated at 115 volts and 4 amps. What is the wattage?

4. The formula for the area of a parallelogram is  $A = BH$  where  $A$  is the area,  $B$  is the length of the base and  $H$  is the height. Find the area of a parallelogram that has a base of 256 centimeters and a height of 123 centimeters.

5. The formula for the perimeter of a regular polygon is  $P = NS$  where  $P$  is the perimeter,  $N$  is the number of sides and  $S$  is the length of each side. Remember in a regular polygon, all sides are equal in length. The perimeter of a regular octagon (8 sided figure) is 196.8 feet. What is the length of each side?

6. Use the following formula to solve this problem:  $x = yz$

Solve for  $x$  if  $y = 22.7$  and  $z = 16.2$