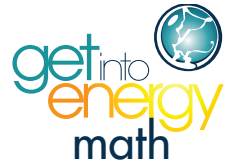


Name: \_\_\_\_\_ Date: \_\_\_\_\_



## Get Into Energy Math

### Student Quiz 18

#### Algebra

1. The line crew is calculating the load resulting from a customer adding an air conditioning unit to their building. The air conditioner uses 1,750 watts of power and over a period of time the crew determines that the air conditioner used 9,625 watt-hours. Which calculation would provide the number of hours (X) that the air conditioner was used?

- A.  $1,750 \text{ watts} / X \text{ hrs} = 9,625 \text{ watt-hrs}$
- B.  $1,750 \text{ watts} * X \text{ hrs} = 9,625 \text{ watt-hrs}$
- C.  $1,750 \text{ watts} / 9,625 \text{ watt-hrs} = X \text{ hrs}$
- D.  $1,750 \text{ watts} * 9,625 \text{ watt-hrs} = X \text{ hrs}$

2. The line crew has reported to a manufacturing location to investigate a customer's complaint about dimming lights. The crew determined that the amount of volts being used by the customer is 22,000 volt-amperes. The crew must calculate the amount of amps load by dividing 22,000 volt-amperes by the system voltage of 220 volts. Which calculation would the crew use?

- A.  $22,000 \text{ volt-amperes} = 220 \text{ volts} * X$
- B.  $22,000 \text{ volt-amperes} * 220 \text{ volts} = X$
- C.  $220 \text{ volts} / 22,000 \text{ volt-amperes} = X$
- D.  $22,000 \text{ volt-amperes} = 0.220 \text{ volts} * X$

3. The line crew has determined that the watts loss due to resistance in the line going to a business is 950 watts. The amps in the line equal 12 amps. What is the ohms of resistance in the line using the following calculation:  $950 \text{ watts} = 12 \text{ amps} * X$ , where X is the ohms of resistance?

- A. 6.6 ohms
- B. 66 ohms
- C. 39.6 ohms
- D. 0.66 ohms

4. The line crew is setting poles and pulling wire from a substation for a new subdivision. Twelve poles are used. The first pole is set 150 feet from the substation and the rest of the poles are 150 feet apart. How many feet of wire does the crew have to pull to get to the midspan of the 12 poles?

- A. 900 ft
- B. 825 ft
- C. 300 ft
- D. 1,200 ft

5. If make-up water is produced at a rate of 50 gallons/minute and a 2,000-gallon tank needs to be filled, which calculation below would determine how many minutes it will take, if X represents minutes?

- A.  $50 \text{ gal/min} * 2,000 \text{ gal} = X \text{ minutes}$
- B.  $50 \text{ gal/min} * X \text{ minutes} = 2,000 \text{ gal}$
- C.  $2,000 \text{ gal} - 50 \text{ gal/min} = X \text{ minutes}$
- D.  $2,000 \text{ gal} * X \text{ minutes} = 50 \text{ gal/min}$

6. A train with 50 cars delivers 1,650 tons of coal to a coal power plant. If Sara is trying to determine the average amount of coal delivered per train car, she can use the following formula:  $50X = 1,650$ . What is the average amount of coal in tons per train car?

- A. 30 tons
- B. 33 tons
- C. 35 tons
- D. 32 tons

7. A coal plant uses 15 tons of coal per hour to fuel the furnaces. If a coal silo contained 500 tons of coal, how much coal is left after 15 hours of operation? Mark used the following equation to determine the remaining coal:  $15 \text{ tons/hour} * 15 \text{ hours} + X = 500 \text{ tons}$ .

- A. 530 tons
- B. 470 tons
- C. 225 tons
- D. 275 tons

8. After a maintenance period, large plants are heated to operating temperature in stages. These stages can include a waiting period called a soak, and the soak allows piping and equipment time to heat and expand evenly. If a plant can be linearly heated from  $50^{\circ}\text{F}$  to  $1,500^{\circ}\text{F}$  in the span of 8 hours, at what temperature should the soak occur if the procedure calls for the soak at the heating span's midpoint?

- A.  $750^{\circ}\text{F}$
- B. 4 hrs
- C.  $775^{\circ}\text{F}$
- D.  $1,550^{\circ}\text{F}$

9. A conveyor that leads to the furnace hopper runs from the feed point 40 feet horizontally and up 30 feet vertically. If a conveyor ran directly from the feed point to the top of the hopper, what would be its length?

- A. 70 ft
- B. 10 ft
- C. 50 ft
- D. 35 ft

10. The gas crew is taking materials out of the warehouse for a major pipe replacement job planned for the upcoming week. The crew has 36 meters ready for replacement, with 4 meters on each pallet. Which equation determines the number of pallets, where the number of pallets is X?

- A. 4 meters per pallet \* X pallets = 36 meters
- B. 4 meters per pallet / X pallets = 36 meters
- C. 36 meters \* 4 meters per pallet = X pallets
- D. X pallets / 4 meters per pallet = 36 meters

11. The gas crew just received an emergency call that a car has hit the side of a house, snapping off a gas meter and causing a gas leak. The crew is 11.5 miles from the event and they have 15 minutes, or 0.25 hours, to get to it. To determine the speed the crew has to drive, the formula is:  $0.25 \text{ hours} * X = 11.5 \text{ miles}$ , where X is the speed. What is the minimum speed the crew could travel and still reach the accident site within 15 minutes?

- A. 33 mph
- B. 46 mph
- C. 37 mph
- D. 66 mph

12. The gas crew is doing a liquid pressure test on a new piping system. The crew has to calculate the amount of water necessary to fill the pipe. The calculation is length of the pipe multiplied by the radius of the pipe squared times  $\pi$  (3.14), which equals the volume of the pipe in cubic feet. This amount is then multiplied by 7.4 gallons of water in a cubic foot. Their pipe is 8 feet long with a 0.25-foot radius, so the formula is  $8 \text{ feet} * (0.25 \text{ feet})^2 * 3.14 * 7.4 \text{ gallons/cubic foot} = X$ , where X is the amount of water needed to fill the pipe. What is X?

- A. 47.7 gallons
- B. 1.57 gallons
- C. 32.5 gallons
- D. 11.6 gallons

13. Darryl, a welder, is reconditioning some weld rod that has gotten damp. The rod has to be heated in an oven until it is completely dried and ready for reuse. The E-60 rod has to be heated at 700°F for 1 hour. The current oven temperature is 250°F. The welder has turned the oven temperature to 700°F. What would be the midpoint in the heating process?

- A. 500°F
- B. 700°F
- C. 350°F
- D. 475°F

14. Nicolette, an instrument and control technician, is checking a solenoid controlled valve. The valve is energized from 24 volts DC and the solenoid draws a current of 4 amps. Nicolette must calculate the solenoid resistance in ohms by dividing the system voltage by the system amperage. Which calculation would provide the solenoid resistance (X) in ohms?

- A.  $24 \text{ volts} * X \text{ ohms} = 4 \text{ amps}$
- B.  $24 \text{ volts} * 4 \text{ amps} = X \text{ ohms}$
- C.  $X \text{ ohms} = 24 \text{ volts} / 4 \text{ amps}$
- D.  $X \text{ ohms} = 4 \text{ amps} / 24 \text{ volts}$

15. George, a journeyman electrician, has determined that the power (wattage) loss due to resistance in the line going to a business is 950 watts. The current (amps) in the line equals 12 amps. What is the resistance (ohms) in the line using the following calculation:  $950 \text{ watts} = 12 \text{ amps} * X$ , where X is the resistance in ohms?

- A. 6.6 ohms
- B. 66 ohms
- C. 39.6 ohms
- D. 0.66 ohms