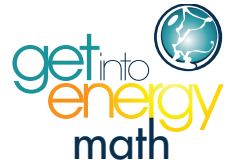


Name: _____ Date: _____



Get Into Energy Math

Student Quiz 19

Algebra

1. The line crew just received an emergency call that a car has hit a pole and people are trapped in the car. The crew is 20.85 miles from the event and they have 30 minutes to get to it. To determine the speed the crew has to drive, the formula is: $0.5 \text{ hrs} * X = 20.85 \text{ miles}$, where X is the speed. What is the minimum speed that the crew could travel and still reach the accident site within 30 minutes?

- A. 45 mph
- B. 42 mph
- C. 60 mph
- D. 21 mph

2. 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

3. Used resin from a water purification system is collected and stored in small metal drums. If a total of 56 drums are ready for shipment and 8 drums can be stacked on each pallet, which calculation below would determine how many pallets are needed if X represents the number of pallets?

- A. $8 \text{ drums per pallet} * X \text{ pallets} = 56 \text{ drums}$
- B. $8 \text{ drums per pallet} + X \text{ pallets} = 56 \text{ drums}$
- C. $56 \text{ drums} * X \text{ pallets} = 8 \text{ drums per pallet}$
- D. $56 \text{ drums} * 8 \text{ drums per pallet} = X \text{ pallets}$

4. In each coal delivery, a train with 80 cars averaging 30 tons of coal per car arrives every day at 4 a.m. Which calculation below would determine how much coal is delivered every day if X represents the tons of coal?

- A. $4 \text{ tons per car} * 80 \text{ cars} = X \text{ tons}$
- B. $80 \text{ cars} + 30 \text{ tons per car} = X \text{ tons}$
- C. $80 \text{ cars} * 30 \text{ tons per car} = X \text{ tons}$
- D. $30 \text{ tons per car} * X \text{ tons} = 80 \text{ cars}$

5. Sara, who works at a nuclear plant that operates at a constant output, is trying to determine the power level, in megawatts, that the plant produces each hour. The total plant output for the day is 12,000 MW-h. She uses the following formula to calculate the power level of the plant: $24 \text{ hours} * X = 12,000 \text{ MW-h}$. What is the power level?

- A. 50 MW
- B. 500 MW
- C. 1,500 MW
- D. 120 MW

6. The auger for the coal deliveries takes coal from the delivery bin 150 feet away to a silo and dumps the coal into the silo from the top at 75 feet elevation. What is the slope of the auger?

- A. 2 ft
- B. 168 ft
- C. 1/2 ft
- D. 225 ft

7. The gas crew is working on a major highway. The job requires that the crew place traffic cones out to warn motorists of the construction activity. The length of the work zone is 50 feet leading up to the trucks, 100 feet around the construction zone, and 20 feet to allow the cars to get back in their lane. The total work zone is 170 feet. The crew has 10 cones. Which calculation would be used to calculate the distance between the cones?

- A. $170 \text{ ft} * X \text{ ft between} = 10 \text{ cones}$
- B. $X \text{ ft between} = 170 \text{ ft} / 10 \text{ cones}$
- C. $10 \text{ cones} = X \text{ ft between} / 170 \text{ ft}$
- D. $170 \text{ ft} * 10 \text{ cones} = X \text{ ft between}$

8. The gas crew is using a small crane and a rope sling to lift a 1,500-pound load of pipes off a flatbed truck. The two rope slings are at a 45-degree angle coming off the single crane hook. The crew needs to know the total pounds of lift the two slings must provide. The calculation is $1,500 \text{ pounds} = X / 1.414$, where X is the weight to be lifted. How many pounds of lift must the two ropes provide?

- A. 3,000 lbs
- B. 2,121 lbs
- C. 1,500 lbs
- D. 1,750 lbs

9. The gas crew is working in a trench installing an underground piping system. The trench is 6 feet deep. The Occupational Safety and Health Administration (OSHA) requires that for the type of soil the crew is working in, the sides of the trench must have 1.5 feet of slope for every 1 foot of trench depth. How far back does the crew need to slope the trench so they can work the installation safely?

- A. 6 ft
- B. 12 ft
- C. 9 ft
- D. 18 ft

10. The gas crew is laying out a new residential piping system. The Class 4 piping system has to be at least 220 feet from the nearest building with 4 or more stories. There are 4-story buildings on both sides of the pipe installation project that are 605 feet apart. What is the distance to the piping system if it is installed at the midpoint between the buildings?

- A. 300 ft
- B. 220 ft
- C. 385 ft
- D. 302.5 ft

11. Lionel, an instrument and control technician, needs to add a relay to control a remote load. The relay has a coil resistance of 100 ohms. Lionel measures the DC voltage across the energized relay coil and finds it measures 22 volts. Lionel needs to calculate the solenoid power dissipation in watts by dividing the voltage squared ($22 \times 22 = 484$) by the resistance. Which calculation would provide the solenoid coil power dissipation (X) in watts?

- A. $484 \text{ volts} / 100 \text{ ohms} = X \text{ watts}$
- B. $X \text{ watts} = 100 \text{ ohms} / 484 \text{ volts}$
- C. $484 \text{ volts} * 100 \text{ ohms} = X \text{ watts}$
- D. $44 \text{ volts} / 100 \text{ ohms} = X \text{ watts}$

12. Charlotte, an electrician, has determined the power loss in an energized solenoid controlled valve is 40 watts at a DC voltage across the solenoid of 22 volts. What is the resistance of the solenoid using the following calculation: $40 \text{ watts} = 22^2 / X$, where X is the resistance in ohms?

- A. 121 ohms
- B. 12.1 ohms
- C. 1.21 ohms
- D. 1.82 ohms

13. 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°F to 1,500°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°F
- B. 4 hrs
- C. 775°F
- D. 1,550°F

14. The auger for the coal deliveries takes coal from the delivery bin 300 feet away to a silo and dumps the coal into the silo from the top at 75 feet elevation. What is the slope of the auger?

- A. 4 ft
- B. 336 ft
- C. 1/4 ft
- D. 400 ft

15. A conveyer that leads to the furnace hopper runs from the feed point 40 feet horizontally and up 30 feet vertically. If a conveyer 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