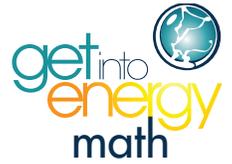


Name: _____ Date: _____



Get Into Energy Math
Student Quiz 16
Ratios and Proportions

1. Jack is pulling cable for an underground job in a city. The crew is using cable-pulling lubricant to assist in the pull and not damage the cable. Jack has used 5 gallons of lubricant for the first 100 feet of cable pulled. What is the ratio for feet of cable pulled to the gallons of lubricant used, expressed in lowest terms?

- A. 50 ft of cable to 1 gal of lubricant
- B. 100 ft of cable to 1 gal of lubricant
- C. 20 ft of cable to 1 gal of lubricant
- D. 500 ft of cable to 1 gal of lubricant

2. Kim is determining how many discs an insulator must have for a given voltage. The engineering calculation estimate indicates that for every 10 kV of voltage, the insulator must have 1 insulating disc. The voltage of the system Kim is working on is 120 kV. How many discs must the insulator have for this voltage?

- A. 11 discs
- B. 10 discs
- C. 12 discs
- D. 20 discs

3. Karen is planning an upgrade job to provide a new service to a factory. She knows it will take 10 linemen 7 days to do a job. How many days will it take if Karen assigns 15 linemen to do the same job?

- A. 4.7 days
- B. 7.5 days
- C. 10.5 days
- D. 3 days

4. Len has 4 different meter reading crews. Using the automated meter reading system, the crews are reading meters at the following rate: crew 1 – 60 meters/day; crew 2 – 125 meters/day; crew 3 – 85 meters/day; and crew 4 – 90 meters/day. What is the average number of meters read by the crews in a single day?

- A. 90 meters/day
- B. 72 meters/day
- C. 78 meters/day
- D. 80 meters/day

5. Jane is placing cones for a work zone around a new gas pipe installation. The site requires 5 cones for every 75 feet of the work zone. What is the ratio of cones to the length of the work zone, expressed in lowest terms?

- A. 1 cone for every 15 ft
- B. 1 cone for every 10 ft
- C. 15 cones for every 75 ft
- D. 1 cone for every $7\frac{1}{2}$ ft

6. Darron is sloping a trench for a gas pipeline installation. For every 5 feet deep, the slope of the trench side walls must be at least $\frac{3}{4}$ of a foot back. If the trench is 15 feet deep, how far back does the crew need to slope the trench so they can work the installation safely?

- A. $1\frac{1}{2}$ ft of slope
- B. $3\frac{3}{4}$ ft of slope
- C. $2\frac{1}{4}$ ft of slope
- D. $\frac{3}{4}$ ft of slope

7. Tom is designing a gas installation job. Tom knows that it will take 12 days to dig the trench with 3 backhoes. If Tom can get 6 backhoes, how many days will it take to dig the trench?

- A. 4 days
- B. 24 days
- C. 3 days
- D. 6 days

8. Wendy is the welder on a pipeline installation. Wendy completed 6 welds the first day, 10 welds the second day, and 8 welds the third day. What is the average number of welds Wendy is completing per day?

- A. 8 welds/day
- B. 6 welds/day
- C. 10 welds/day
- D. 12 welds/day

9. Faith is clearing brush around utility poles and has mixed 640 ounces of gas with 40 ounces of oil in a trimmer's 2-cycle motor. What is the ratio of gas to oil, expressed in lowest terms?

- A. 16:1 oz
- B. 1:16 oz
- C. 1:8 oz
- D. 8:1 oz

10. Alex is sloping a trench for a directed buried electrical line installation. For every 1 foot of depth, the slope of the trench side walls must be at least $1\frac{1}{2}$ feet back. If the trench is 10 feet deep, how far back does the crew need to slope the trench so they can work the installation safely?

- A. 12 ft of slope
- B. 10 ft of slope
- C. 15 ft of slope
- D. $10\frac{1}{2}$ ft of slope

11. Hank needs to pump out a trench that has filled with rain water. The portable gas pump runs for 3 hours and uses 6 gallons of gas. What is the ratio of gas use to hours of pump operation, expressed in lowest terms?

- A. 1 gallon of gas for 2 hours of pump operation
- B. 1 gallon of gas for $\frac{1}{2}$ hour of pump operation
- C. 1 gallon of gas for 45 minutes of pump operation
- D. 3 gallons of gas for 6 hours of pump operation

12. Jane is calculating the loads of fill she needs to fill a trench where a new pipe was installed. For every 8 feet of trench, Jane needs 6 tons of fill. How many tons of fill does Jane need for a 24-foot trench?

- A. 12 tons of fill
- B. 6 tons of fill
- C. 18 tons of fill
- D. 8 tons of fill

13. Five welders are working on a new gas pipeline installation. The welders work at different rates depending on the complexity and quality of their welding ability. The welders are welding 30 inches of bead/hour, 21 inches of bead/hour, 15 inches of bead/hour, 25 inches of bead/hour, and 29 inches of bead/hour. What is the average rate of welding for the 5 welders?

- A. 20 in/hr
- B. 25 in/hr
- C. 24 in/hr
- D. 26 in/hr

14. Ken's crew has just finished installations for a new subdivision. There were 39 new customers and the crew had to install 13 fuses. What is the ratio of customers to fuses expressed in lowest terms?

- A. 39 customers to 13 fuses
- B. 26 customers to 1 fuse
- C. 5 customers to 1 fuse
- D. 3 customers to 1 fuse

15. Ron has 5 different meter reading crews. Using the automated meter reading system, the crews are reading meters at the following rate: crew 1 – 70 meters/day; crew 2 – 130 meters/day; crew 3 – 90 meters/day; crew 4 – 80 meters/day; and crew 5 – 100 meters/day. What is the average number of meters read by the crews in a single day?

- A. 98 meters/day
- B. 76 meters/day
- C. 94 meters/day
- D. 84 meters/day

16. Kim is reviewing a completed transmission job. Her task is to determine the average amount of wire the crew pulled per day. The crew numbers were 1,000 feet, 1,500 feet, 850 feet, 1,250 feet, 1,500 feet, and 2,000 feet. What was the average number of wire pulled in one day?

- A. 1,350 ft/day
- B. 1,620 ft/day
- C. 1,320 ft/day
- D. 1,100 ft/crew

17. Karen is heating up welding rods for a weld job to cover a road trench with a plate of steel. She needs 20 welding rods for every 5 feet of weld on the plate. What is the ratio of welding rod to the length of the weld, expressed in lowest terms?

- A. 4 welding rods for every 5 feet of weld
- B. 5 welding rods every 5 feet of weld
- C. 2 welding rods for every 1 foot of weld
- D. 4 welding rods for every 1 foot of weld

18. Mike is in charge of the warehouse, and he has to restock all the gas distribution trucks on Friday afternoon so they are ready to go on Monday morning. Two warehouse workers typically take 6 hours to restock the trucks. Mike has assigned 3 warehouse workers to the restocking effort. How long will it take the 3 warehouse workers to restock all the trucks?

- A. 2 hours
- B. 3 hours
- C. 6 hours
- D. 4 hours

19. Joan has received a call from dispatch to respond to an accident involving a car and utility pole. The dispatcher has asked Joan for an estimate of how long it will take her to get to the car accident. Joan knows that if she can do 45 mph it will take her 55 minutes to get to the accident. If Joan gets on the highway, she can do 65 mph. How long will it take Joan to respond to the car accident if she uses the highway?

- A. 30 minutes
- B. 38 minutes
- C. 53 minutes
- D. 79.4 minutes

20. Yolanda is responsible for several crews doing pipe fusions in a new residential subdivision. The 3 crews averaged 30 fusions the first day, 28 the second day, 26 the third day, and 20 the final day. What is the average number of fusions the 3 crews are completing per day?

- A. 34 fusions/day
- B. 26 fusions/day
- C. 27 fusions/day
- D. 8 fusions/crew

21. Roger needs to pump out a trench that has filled with rain water. The portable gas pump runs for 3 hours and uses 6 gallons of gas. How many gallons of gas would be used if the pump runs for 9 hours?

- A. 12 gal
- B. 9 gal
- C. 18 gal
- D. 36 gal

22. Gerry is designing a pipe installation job. Gerry knows that it will take 12 days to dig the required trench with 3 backhoes. If Gerry can get 18 backhoes, how many days will it take to dig the trench?

- A. 4 days
- B. 6 days
- C. 3 days
- D. 2 days

23. Harris is determining how many poles a line crew can set in a given day. The crews set poles at different rates based on the complexity of the job and soil conditions. The crews set the following number of poles: 5, 6, 3, 2, 6, and 8. What is the average number of poles a crew should be able to set in a day?

- A. 6 poles
- B. 5 poles
- C. 4 poles
- D. 7 poles

24. Kristen is calculating the tons of concrete she needs to fill a trench where a new pipe was installed. For every 8 feet of trench, Kristen needs 12 tons of concrete. How many tons of concrete does Kristen need for a 24-foot trench?

- A. 36 tons of concrete
- B. 32 tons of concrete
- C. 18 tons of concrete
- D. 24 tons of concrete

25. Karen is planning an upgrade job to provide a new service to a factory. She knows it will take 10 linemen 6 days to do a job. How many days will it take if Karen assigns 30 linemen to do the same job?

- A. 4 days
- B. 3 days
- C. 2 days
- D. 12 days