Sample Math Test

This math quiz is only a sample of the math level expected of entry level apprentices. This electrical apprenticeship program starts at this level then advances rather quickly to higher levels of math. If you feel you are not at this level, you must improve your math skills prior to being indentured. The math skills required of Missouri Valley apprentices are: addition, subtraction, multiplication, and division of whole numbers; adding, subtracting, multiplying, and dividing of fractions; ability to change a mixed number to an improper fraction and an improper fraction to a mixed number; change a fraction to a decimal and change a decimal to a fraction; must be able to figure percentages and ratios; and must be able to read a ruler. You will also need to know the metric prefixes and their values.

1. Jill has 17 wire reels to deliver to a job. She knows each reel weighs 216 pounds. How many pounds will Jill need to deliver?

2. You need to drill a hole that is .8125 inches in diameter. What size drill bit do you need to use?

3. Will a copper wire that is 0.3249 inches in diameter fit through a hole drilled with a 5/16 inch bit?

4. A helper must add spacers to raise a switch bracket. Each spacer is 3/16″ thick. How many spacers will be needed to raise the switch 1 1/8″?

5. The letters KV stand for Kilovolt. If a distribution line is said to be a 7.2 KV line, what is the actual voltage of the line expressed in volts?

6. Journeyman Joe makes $25.00 per hour. Apprentice Al makes 85% of Joe's hourly rate. How much more money would Joe make than Al, if Joe worked 35 hours and Al worked 28 hours?

7. Job material is ordered for the amount of $1,250.00. The contractor is offered a 3 ½% discount for cash. What did the material cost if the contractor took advantage of the discount?

8. If 1,680 out of 3,500 trucks are diesels, what percent of the trucks are diesels?

9. A framing crew starts the job with a 20 pound box of staples. The first day they use 2 ¼ pounds, the second day they use 3 7/8 pounds, and the third day 2 5/16 pounds. How many pounds of staples are left over?

10. A reducer has a reduction ratio of 28.30 to 1. If the input value was 7500 what would be the output value?

11. Using the formula I = P divided by E, where I = current, P = power and E = volts, how much power will be drawn by a heater that consumes 40 amps of current and operates on 480 volts?

12. #4 copper wire weighs 126.3 lbs per 1,000 feet. How much would 137 feet weigh?

13. Concrete weighs about 145 lbs per cubic foot. How much would 2 cubic yards weigh?

14. A full reel of cable has a diameter of 72″. You need 471′ of cable for a job. How many turns of cable would need to be taken off the reel?

1. 3672 pounds
   216 x 17 = 3672

2. A 13/16 inch drill bit
   .8125 = 8125/10000 reduced to lowest terms = 13/16

3. NO
   5/16″ = 0.3125″ -- smaller than 0.3249″ wire

4. 6 spacers
   1 1/8″ ÷ 3/16″ = 9/8 x 16/3 = 144/24 = 6

5. 7200 volts
   K = Kilo = 1000 So 7.2 x 1000 = 7200 volts

6. $280.00
   $25.00 x 85% = 25 x .85 = 21.25 25 x 35 = 875 21.25 x 28 = 595 875 – 595 = 280

7. $1,206.25
   $1,250.00 x 3 ½ % = 1,250 x .035 = 43.750 1,250 – 43.75 = 1,206.25

8. 48%
   1680 ÷ 3500 = 0.48 = 48%

9. 11 9/16 pounds of staples left over
   2 ¼ + 3 7/8 + 2 5/16 = 8 7/16 20 lbs. – 8 7/16 lbs. = 11 9/16 lbs.

10. 265.0176
    7500 ÷ 28.3 = 265.0176

11. 19,200
    [I = P ÷ E] = [P = I x E] 480 x 40 = 19,200

12. 17.3031 pounds
    126.3 ÷ 1000 = 0.1263 per foot 0.1263 x 137 = 17.3031

13. 7830 pounds
    1 cubic yard = 27 cubic feet. 27 x 2 = 54 145 x 54 = 7830

14. 25 turns
    circumference = ? x diameter 3.14 x 72″ = 226.08″ per turn 226.08 ÷ 12 = 18.84 feet per turn 471 ÷ 18.84 = 25