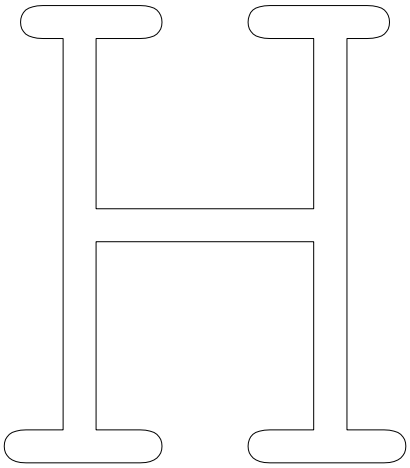
REMT 2005

ANSWERS



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15. _____

MATHEMATICAL

LOGISTICS

_____ _____ _____

LAST NAME FIRST NAME GRADE

1. The product of two real numbers is 5, and the sum of their reciprocals is 2. What is the sum of the two numbers?

2. For a certain set of 12 distinct numbers, which includes the number 47, the average value will decrease by 3 if 47 is removed from the set. What is the average of all 12 of these numbers?

3. I have a box of 8 different colored pencils. In how many ways can I select three of these pencils to design a three-color poster?

4. How many distinct 8-letter sequences can be made using all the letters in the word SEQUENCE?

5. A certain orchard has 16 rows of trees. There are 20 trees in the first row, 21 trees in the second row, and so forth. (Each succeeding row has one more tree than the previous row.) How many trees are in the orchard altogether?

6. If two distinct integers are selected at random in the range from 1 to 10, what is the probability that their product is even?

7. On my last trip I drove the first 30 miles in the country at 60 miles per hour. Then I reached the city and drove another 30 miles but at 40 miles per hour. What was my average speed, in miles per hour, for this trip?

8. The sum of two integers is 59. If the larger is divided by the smaller, the quotient is 2 and the remainder is 8. What is the larger number?

9. My lucky number consists of the digit 6 written 500 times. What is the remainder when my lucky number is divided by 9?

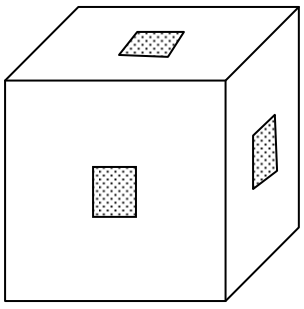
10. There is a country called Taxland, where the government imposes a 25% tax on *all* financial transactions. The strange thing is, they even impose the tax *on the taxes*. For example, on a \$5 purchase, you pay the \$5, *plus* the tax on \$5, namely \$5×25%=\$1.25, *plus* the tax on \$1.25, namely \$1.25×25%=\$.3125, *plus* the tax on \$.3125, namely \$.3125×25%=\$.078125, *plus*…and so on and so forth. If you made a \$90 purchase in Taxland, what is the *total* amount you would have to pay, *calculated exactly*?

11. A laboratory contains two 8-ounce beakers, labeled A and B. A contains 5 ounces of a 50% alcohol solution; B contains 6 ounces of a 30% alcohol solution. If a lab worker pours as much liquid as possible from A into B, stirs thoroughly, and then pours as much as possible from B into A, what will be the percent of the alcohol solution in A?

12. An octal number is written using only the digits 0 through 7. So a decimal number that does not contain the digits 8 or 9 might possibly be mistaken for an octal number. What percentage of the decimal integers from 1 to 1000 might possibly be mistaken for an octal number?

13. If three standard six-sided dice are rolled simultaneously, what is the probability that the sum will be 15 or greater?

14. A solid wooden cube measuring 5 inches on a side has 1x1 inch square holes bored all the way through at the centers of each face, as shown. How many cubic inches of wood remain after the holes are bored?



15. The old professor began school at the age of 6, and spent 30% of his life getting an education. He then devoted 45% of his life to the teaching of mathematics. If he has been retired for 12 years now, how old is the professor?