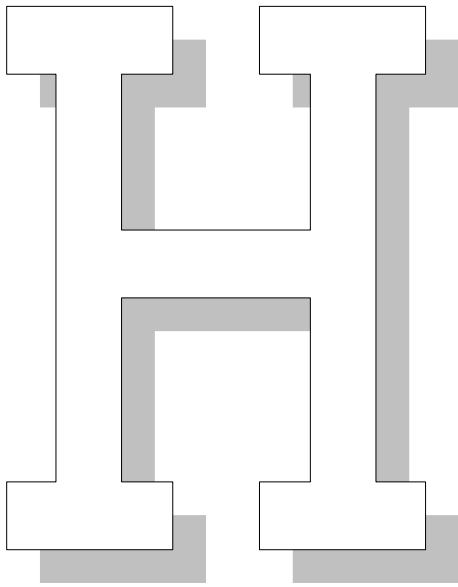


***REMT 2009***

***ANSWERS***



***MATHEMATICAL***

***LOGISTICS***

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
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13. \_\_\_\_\_
14. \_\_\_\_\_
15. \_\_\_\_\_

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LAST NAME

FIRST NAME

GRADE

1. What is the coefficient of  $x^3y^7$  in the expansion of  $(x + y)^{10}$ ?
2. What are the last two digits of the number  $11^{2009}$ ?
3. Water is being pumped through two pipes at the same velocity. The smaller pipe can carry 100 cubic inches per minute. How many cubic inches per minute can the larger pipe carry if its diameter is three times as large?
4. On a recent trip I drove for  $3\frac{1}{2}$  hours at an average speed of 45 miles per hour. The return trip, over the same route, took me  $4\frac{1}{2}$  hours. What was my average speed in miles per hour for the return trip?
5. At the Farmers' Market, apples cost 25 cents apiece and pears cost 40 cents apiece. I bought a mixed bag of apples and pears for 9 dollars. If there were 27 pieces of fruit in the bag, how many of them were apples?

6. How many of the integers from 1 to 1000 are divisible by 3 or 5 (or both)?
  
  
  
  
  
  
  
  
  
  
7. What is the smallest integer  $n$  for which the number  $7^n$  has more than 100 decimal digits?
  
  
  
  
  
  
  
  
  
  
8. What is the smallest integer greater than 5 that leaves a remainder of 5 when it is divided by each of 7, 11, and 13?
  
  
  
  
  
  
  
  
  
  
9. If a fair coin is tossed five times in a row, what is the probability that it will come up heads exactly three times?
  
  
  
  
  
  
  
  
  
  
10. A seven-letter computer password is to be selected using three A's, two B's, a C, and a D. How many different passwords of this type can be selected?

11. What rational number, written as a fraction in lowest terms, does the sum  $0.2 + 0.2^2 + 0.2^3 + 0.2^4 + \dots$  become arbitrarily close to?
  
  
  
  
  
  
  
  
  
  
12. An airplane leaves an airport and flies north at 400 miles per hour. One hour later a second plane leaves the same airport and flies east at 250 miles per hour. How many miles apart are the two airplanes two hours after the second plane left the airport?
  
  
  
  
  
  
  
  
  
  
13. If a drawer contains three red socks and two white socks, and if, in total darkness, I take out two socks, what is the probability that when I turn on the light it will turn out that I have gotten a matching pair?
  
  
  
  
  
  
  
  
  
  
14. How many distinct 11 letter sequences can be made using all the letters in the word MISSISSIPPI?
  
  
  
  
  
  
  
  
  
  
15. Forty children at a summer camp are going boating. Some are in canoes and some are in rowboats. Each canoe carries two children and each rowboat carries three. If there are twice as many rowboats in use as there are canoes, how many of the children are in canoes?