

REMT 2003

ANSWERS



MATHEMATICAL

LOGISTICS

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15. _____

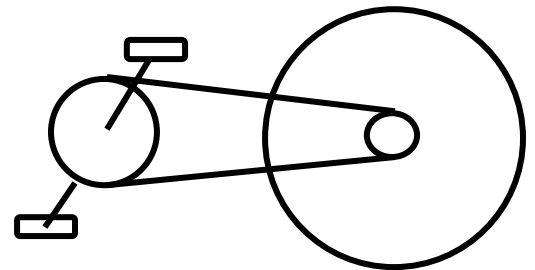
LAST NAME

FIRST NAME

GRADE

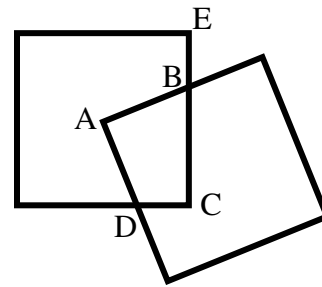
1. How many distinct ten-letter sequences can be made by rearranging the letters in the sequence **HIGHSCHOOL**?
2. If a fair coin is flipped **SIX** times in a row, what is the probability that it will land heads exactly three times?
3. A drawer contains 3 red socks and 4 blue socks. If two socks are drawn from the drawer at random, what is the probability that they form a matching pair?
4. What positive number is one-fifth of its own cube?
5. The sum of two integers is 31. If the larger is divided by the smaller, the quotient is 2 and the remainder is 4. What is the larger number?

6. How many minutes does it take a quarter-mile long train traveling at 15 miles per hour to pass completely through a one-and-a-quarter mile tunnel?
7. What positive number is four times its own cube ?
8. If $\langle a, b \rangle = 2a + b - 3$, what is $\langle \langle 2, 3 \rangle, \langle 4, 5 \rangle \rangle$?
9. I can ride my bicycle uphill at 12 miles per hour, but I can come back down much faster. If my average speed for a round trip is 18 miles per hour, how many miles per hour can I ride downhill?
10. On my bicycle, each pedal crank is 6 inches long. The large sprocket is 7 inches in diameter, the chain is 60 inches long, and the small sprocket is 3 inches in diameter. If the wheels are 27 inches in diameter, how many inches, to the nearest inch, does the bicycle travel for each revolution of the pedals?



11. Suppose that on each separate swing, a pendulum describes an arc whose length is 90% of the length of the previous arc. If the length of the first arc is 30 inches, how many total inches does the pendulum travel before it comes to rest?

12. Two squares, both of area 24 square inches, are arranged as shown. Vertex A of one square is at the center of the other square, and point B is two-thirds of the way from C to E. What is the area in square inches of quadrilateral ABCD?



13. What is the product of the roots of the polynomial $x^4 - 5x^3 + 4x^2 + 3x - 2$?

14. What is x if $2^{x^2} = 2^{37} - 2^{x^2}$?

15. There are three snakes in the snake house at the zoo. The two smallest snakes total 11 feet in length. The two largest snakes total 27 feet in length. The average length of all the snakes is 8 feet. How many feet long is the middle snake?

