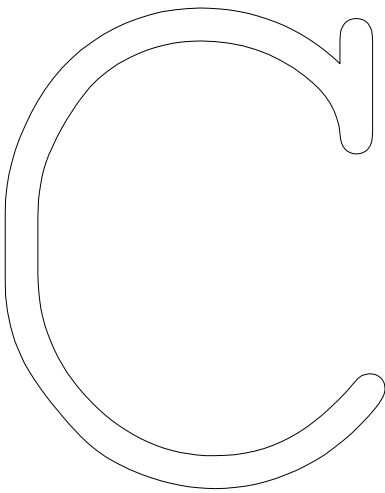


REMT 2005

ANSWERS



MATHEMATICAL

MANIPULATION

1. _____
2. _____
3. _____
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14. _____
15. _____

LAST NAME

FIRST NAME

GRADE

Be sure to write each of your answers on the answer sheet.

1. The sum of the integers from 1 to 100 is 5050. What is the sum of the odd integers from 1 to 99?

2. What number is $\frac{7}{9}$ of the way from 300 to 498?

3. Solve the equation $a = \frac{b+1}{b+2}$ for b in terms of a .

4. Simplify as much as possible the expression: $\frac{2x^2 - 3x - 2}{2x^2 + 7x + 3}$.

5. Simplify as much as possible the expression: $\frac{1}{\sqrt{x}-2} - \frac{\sqrt{x}}{x-4}$.

6. The number 100 has nine distinct positive integer divisors. What is the sum of all these divisors?
7. P is inversely proportional to the square of Q . If $P = 5$ when $Q = 2$, what is P when $Q = 6$?
8. A ship leaves port at noon and sails at a constant speed of 12 knots. A second ship leaves the same port two hours later and sails on the same course at a speed of 15 knots. At what time will the second ship overtake the first?
9. For a certain linear function, $f(2) = 6$ and $f(8) = 9$. What is $f(15)$?
10. Jane just won a contest in which the prize is equal to her weight in new U.S. nickels. If 17 of these nickels weighs 3 ounces, and if Jane weighs 90 pounds, how many dollars did she win?



11. Solve for x in the equation $\log_3 x + \log_3(x + 4) = 2$.

12. Solve for x in the equation $3^{2x} + 3^{x+1} = 10$.

13. What trigonometric function is equal to $\csc x - \frac{\sin x}{1 + \cos x}$?

14. In a lab experiment a fruit fly population's size is given by the formula $P(t) = \frac{230}{1 + 56.5e^{-0.37t}}$, where t is the number of days since the start of the experiment. How many days, to the nearest half-day, does it take for the population to reach 180?

15. A statue stands atop a building. From a point 400 feet away the angle of elevation of the base of the statue is 45 degrees, and from the same point the angle of elevation of the top of the statue is 47.2 degrees. To the nearest foot, how high is the statue?

