REMT 2007

ANSWERS

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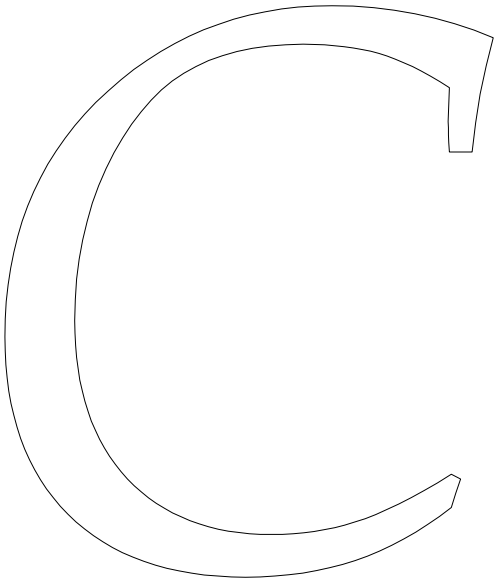


MATHEMATICAL

MANIPULATION

_____ _____ _____

LAST NAME FIRST NAME GRADE

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

1. Simplify as much as possible the expression: $\dfrac{2x^2+x-1}{2x^2-5x+2}$.

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

3. Solve for x in the equation $\dfrac{3}{x}+\dfrac{1}{2}=\dfrac{4}{3}$.

4. Solve the equation $a=\dfrac{2b+1}{b-1}$ for b in terms of a.

5. P is inversely proportional to Q. If P is 6 when Q is 35, what is P when Q is 15?

6. Write a formula for the inverse of the function $f(x) = 5x - 3$.

7. The graph of a certain linear function crosses the x-axis where $x = 5$ and crosses the y-axis where $y = 2$. What is the value of y when $x = 10$?

8. The graph of a certain quadratic function crosses the x-axis where $x = -3$ and $x = 4$ and crosses the y-axis where $y = -24$. What is y when $x = 5$?

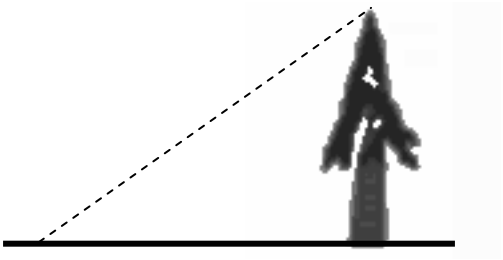
9. Solve for x in the following equation: $8^{2+x} = 126 + 8^x$.

10. Solve for x in the following equation: $\log(100x + 50) = \log(3x) + 2$.

11. If $\log_a x = 5.6$ and $\log_a y = 2.2$, what is $\log_a (xy^2)$?

12. What trigonometric function is equal to the expression $\csc x - \cos x \cot x$?

13. From a point on level ground 500 feet from the base of a tree, the angle of elevation to the top of the tree is measured to be 25 degrees. What is the height, to the nearest foot, of this tree?



14. In a certain triangle ABC, angle A measures 60 degrees. Side AB has length 7 and side AC has length 15. What is the length of side BC?

15. The formula $P(t) = \dfrac{100}{1 + 30e^{-t/2}}$ predicts the size (in grams) of a biological cell population after t hours. After how many hours, to the nearest half-hour, is the population expected to be 70 grams?