

Place all answers on the line provided. Give simplified EXACT answers. Calculators are permitted. You are not expected to answer all of the questions.

- _____ 1. If 5 minus the reciprocal of $5 - x$ equals the reciprocal of $x + 5$, what is x ?
- _____ 2. Two cars start at the same point on a straight highway facing opposite directions. Each drives 12 miles, takes a 90° left turn, and drives 5 miles. How far apart are the two cars?
- _____ 3. Four positive integers have a sum of 78. What is the greatest possible product of these five numbers?
- _____ 4. In how many zeros does $(8)^6(15)^7$ end?
- _____ 5. The difference between two real numbers is 2, while the difference between their cubes is 386. Find the numbers.
- _____ 6. Find how many integers between 1 and 500 are divisible by all of the numbers 4, 5, and 6.
- _____ 7. What is the maximum value of the product $2xy$ if $x + 4y = 500$?
- _____ 8. A regular hexagon has an area $30\sqrt{3}$ square cm. on each side of this hexagon, an equilateral triangle is constructed. What is the total area of the resulting shape?
- _____ 9. Solve for x the equation $:\log_3(\log_5(2x + 1)) = 1$.
- _____ 10. Suppose a and b are positive integers such that $\frac{a}{3} + \frac{b}{5} = \frac{17}{15}$