



Math Olympiad and Problem Solving Programs  
E220 - Intermediate Math Competitions  
Problem Set 12.2 - MATHCOUNTS

Name:

Date:

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1.
2.
3.
4. If  $500 \leq x^2 \leq 1000$ , then if we square root all sides of the inequality, we get  $22.36 \leq x \leq 31.62$ . So  $x$  is between 23 and 31 inclusive. There are  $31 - 23 + 1 = \text{\texttt{9}}$  numbers in this set.
5.
6.  (the answer key was wrong)
7.
8.
9.  $8^{10} \times 5^{22} = (2^3)^{10} \times 5^{22} = 2^{30} \times 5^{22} = (2 \times 5)^{22} \times 2^8 = 10^{22} \times 256$ . Now we can see how many digits it will have.  $10^{22}$  is a 1 followed by 22 zeros. If you multiply 256 by this, then you will get 256 followed by 22 zeros. So there is a total of  digits.
10.