2011 John O'Bryan Mathematical Competition

10. The number of inches in the length of the minor arc intercepted by a chord whose length is $\sqrt{1200}$ inches is $k\pi$ inches. If the radius of this circle is 20 inches, find the value of k. Express your answer as an improper fraction reduced to lowest terms.

11. Let x, y, and z represent integers greater than 1. If $\left(x^7\right)^y = x^7 x^z$, find the sum of the smallest two distinct values of $|z - y|$.

12. Two integers are formed by writing the same two digits in reverse order. The sum of the two integers is 22 times the difference between the digits. Also, the difference between the squares of the two integers is

Name: ANSWERS Team Code:

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Note: All answers must be written legibly and in simplest form. Exact answers are to be given unless