



THE OHIO COUNCIL OF  
TEACHERS OF MATHEMATICS

Thirty-ninth Annual Contest

February 25, 2012

You may write on this test. Please keep this test when you finish.

During the test, each student is permitted to have one or more handheld calculators, including the TI-89, TI-92, TI-nspire, Voyage 200, and HP95. Calculators with cordless transmission capabilities must be taped over. **No cell phones, PDAs, laptops, or other electronic devices are allowed in the test room. If you have one, give it to your coach or test monitor before the test begins, or your score may be voided.**

On the front of the answer sheet, print your first name, middle initial, and last name.

Please check the information on the back of the answer sheet, and correct if necessary.

**Instructions:**

- Place each answer on its proper blank on the answer sheet.
- There may be one or more questions which are impossible. For the purpose of this test, write "impossible" or "no solution" or  $\emptyset$  or  $\{ \}$ . **NO CREDIT** given for  $\{ \emptyset \}$ .
- There may be one or more questions with multiple answers. In such cases, all answers are required unless specified otherwise.
- Write multiple solutions as (e.g.) " $\{2, 3\}$ " **OR** " $x = 2$  or  $x = 3$ " **OR** "2, 3". **NO CREDIT** given for ordered pair form "(2,3)". **NO CREDIT** given for " $x = 2$  **AND**  $x = 3$ ."
- In problems 1–20, **EXACT ANSWERS IN SIMPLEST FORM** are necessary.  
For example: write " $1 + \sqrt{2}$ " (not 2.414...); write " $\frac{\pi}{4}$ " (not 0.785398...);  
write " $x = 5$  or  $x = 1$ " (not  $3 \pm 2$ ); write "1" (not  $x^0$ );  
write " $\frac{4}{9}$ " or " $0.\overline{4}$ " (not  $\frac{16}{36}$ , nor  $(\frac{2}{3})^2$ , nor 0.4444).
- After problem 20, unless otherwise specified, the answer may be written in **exact decimal, radical or fractional form, or decimal form rounded off to four places to the right of the decimal point.**
- Figures are not necessarily drawn to scale.
- The questions are **not** arranged according to difficulty.
- Testing time: **60 MINUTES**

**Grading:**

- Each correct answer counts one point. No partial credit will be given.
- There is no penalty for guessing.