

Names:

High School:

Thursday November 18, 2010 from 10:35 - 11:20 a.m. (45 minutes)

Group Work (11th and 12th grades)

Note: You must show all your work to receive credit. An answer alone without any supporting work will receive no credit.

1. In base 10 notation, find how many zeros terminate the number

$$100! = 100 \cdot 99 \cdot 98 \cdot 97 \cdot 96 \cdots 5 \cdot 4 \cdot 3 \cdot 2 \cdot 1.$$

Group Test for Grades 11 and 12

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2. A fair 6 sided die is rolled six times. Find the probability of rolling at least a five, at least 5 times.

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3. Find the number of distinct positive integral divisors of $(105)^5$, excluding 1 and $(105)^5$.

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4. If c is a real number and the negative of any solution of $x^2 - 3x + c = 0$ is a solution of $x^2 + 3x - c = 0$, find the solutions of $x^2 - 3x + c = 0$.

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5. Find all x solutions to

$$4^x - 8 \cdot 2^x + 12 = 0.$$

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6. The arithmetic mean of two numbers a, b is 6 and the geometric mean is 10. Find a quadratic polynomial that has a, b as roots.