

November 2, 1983

WOCOMAL FRESHMAN MEET

ROUND I: ARITHMETIC - ORDER OF OPERATIONS & EVALUATION

ALL ANSWERS MUST BE IN SIMPLEST EXACT FORM

1. Simplify $7 + 4[2 + 3(1 + 5)] - 15 + 18 \cdot 2 \div 12$

2. If $a \# b = \frac{a + ab}{b}$ and $a _ b = a - ab$, evaluate $4 \# (2 _ 5)$.

3. If $a = -1$, $b = 6$, $c = \frac{1}{3}$, $x = 3$, and $d = -2$, find the value of $(3a + b^2c)^2 \div [2x - (b \div d)]^2$.

ANSWERS: (1 point) 1. _____

(2 points) 2. _____

(3 points) 3. _____

Assabet Valley, Bartlett, Hudson

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ROUND II: LINEAR EQUATIONS

ALL ANSWERS MUST BE IN SIMPLEST EXACT FORM

1. Find the value of n for which $\frac{1}{4}n - \frac{1}{8}n = 2$.

2. If $2(13 + x) = 2x - 7 - (3x + 4)$ solve for x .

3. Solve for y if $y - \{3 - [2y + 3(y - 1)] + 5\} = 2y$.

ANSWERS: (1 point) 1. $n =$

(2 points) 2. $x =$

(3 points) 3. $y =$

St. John's, Shrewsbury, Tantasqua

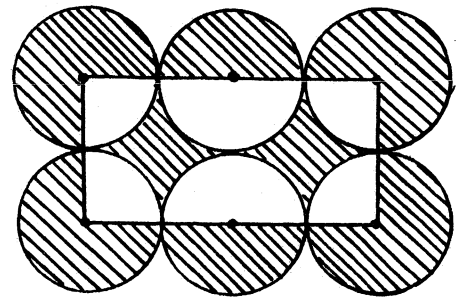
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ROUND IV: GEOMETRY - PERIMETER & AREA; VOLUME OF RECTANGULAR SOLIDS

ALL ANSWERS MUST BE IN SIMPLEST FORM

1. Two sides of an isosceles triangle have length 15. The altitude drawn to the base has length 9. If the perimeter of the triangle is 54, what is its area?
2. At n cents a square yard, how much will it cost to plaster the walls and ceiling of a room a feet long, b feet wide, and c feet high?
3. A rectangle connects the centers of the six touching circles, each with a radius of 5. Find the area of the shaded portion. Use $\pi = 3.14$.



ANSWERS: (1 point) 1. _____

(2 points) 2. _____ cents

(3 points) 3. _____

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TEAM ROUND: NUMBER THEORY, PRIMES, DIVISIBILITY, LCM, GCF, SEQUENCES

ALL ANSWERS MUST BE EXPRESSED IN SIMPLEST EXACT FORM

EACH ANSWER COUNTS THREE POINTS

ANSWERS

1. What is the quotient when the least common multiple of 240 and 160 is divided by their greatest common factor? 1. _____
2. Find two positive integers whose product is 100,000 such that neither integer contains a zero as one of its digits. 2. _____
3. Find the greatest integer which will divide evenly into 98, 75, and 189. 3. _____
4. What is the quotient of the product of the four smallest odd composite numbers divided by the product of the three smallest odd primes? 4. _____
5. What is the length of the longest unmarked measure that can be used to measure exactly 48, 582, and 786 yards of material? 5. _____ yards
6. Write the rule relating y and x which gives the following set of ordered pairs:

x	0	1	2	3	4	5
y	1	3	5	7	9	11

6. $y =$ _____
7. The greatest common factor of two positive integers is 6 and the least common multiple is 360. If one of the integers is 72, what is the other? 7. _____
8. What is the smallest prime number that 25872931 is divisible by? 8. _____

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WOCOMAL FRESHMAN MEET ANSWERS

ROUND I

(1 point) 1. 75

(2 points) 2. $\frac{7}{2}$ or $3\frac{1}{2}$ or 3.5

(3 points) 3. 1

TEAM ROUND
(3 points each)

1. 6

ROUND II

(1 point) 1. $n = 16$

(2 points) 2. $x = -\frac{37}{3}$ or $-12\frac{1}{3}$

(3 points) 3. $y = \frac{11}{4}$ or $2\frac{3}{4}$ or 2.75

2. 32 and 3125

3. 1

4. 675

ROUND III

(1 point) 1. $(10111)_2$

(2 points) 2. $\frac{1}{3}$

(3 points) 3. 24 km. per hr.

5. 6 yards

6. $y = 2x + 1$

ROUND IV

(1 point) 1. 108

(2 points) 2. $\frac{n}{9} \{2ac + 2bc + ab\}$ or
 $\frac{2acn + 2bcn + abn}{9}$ etc.

7. 30

(3 points) 3. 357

8. 7