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

November 2, 1983 WOCOMAL FRESHMAN MEET

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. <u>y =</u>

St. John's, Shrewsbury, Tantasqua

November 2, 1983

ROUND III: OPEN

ALL ANSWERS MUST BE IN SIMPLEST EXACT FORM

1. Find the integer in base 2 immediately preceding the number (11000).

2.

I H P C L M T S -4 -3 -2 -1 0 1 2 3

Give the numerical coordinate (exact value) of the point between H and T that is twice as far from H as it is from T.

3. Suppose the distance from Boston to Worcester is 50 kilometers. If a car is driven from Boston to Worcester at 20 kilometers per hour and on the return trip at 30 kilometers per hour, what is the average rate of speed of the car for the entire trip?

ANSWERS:	(1 point)) 1	()2
		-		
	(2 points	1) 2.		

(3 points) 3. km. per hr.

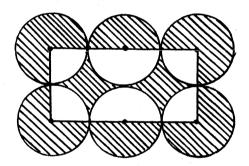
Auburn, Leicester, Notre Dame

November 2, 1983 WOCOMAL FRESHMAN MEET 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 <u>yard</u>, how much will it cost to plaster the walls and ceiling of a room <u>a feet</u> long, <u>b feet</u> wide, and <u>c feet</u> 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 $\mathcal{M} = 3.14$.



ANSWERS: (1 p	oint) .	1.
---------------	---------	----

(2 points) 2._____ cents

(3 points) 3._____

Southbridge, Worcester Academy

No	vember 2, 1983 WOCOMAL FRESHMAN MEET	
TE	AM ROUND: NUMBER THEORY, PRIMES, DIVISIBILITY, LCM,	GCF, SEQUENCES
AL	LANSWERS MUST BE EXPRESSED IN SIMPLEST EXACT FORM	
EA	CH ANSWER COUNTS THREE POINTS	ANSWERS
1.	What is the quotient when the least common multipl of 240 and 160 is divided by their greatest common factor?	.e 1
2.	Find two positive integers whose product is 100,0 such that neither integer contains a zero as one o its digits.	000 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 prod of the three smallest odd primes?	4 uct
5.	What is the length of the longest unmarked measure that can be used to measure exactly 48, 582, and 786 yards of material?	
6.	Write the rule relating y and x which gives the following set of ordered pairs: $\begin{array}{c ccccccccccccccccccccccccccccccccccc$	e 6. <u>y</u> =
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?	3 7
8.	What is the smallest prime number that 25872931 is divisible by?	8
Ass Shej	abet Valley, Bromfield, Notre Dame, Quaboag, St. Joh pherd Hill, Southbridge, Tantasqua, Worcester Academ	in's ly

November 2, 198	3 WOCOMAL FRESHMAN MEET ANSWERS	3	
ROUND I		TEAM	ROUND oints each)
(l point) l.	75	(5 pt	Sints each)
(2 points) 2.	$\frac{7}{2}$ or $3\frac{1}{2}$ or 3.5	1.	6
(3 points) 3.	1		
ROUND II		2.	32 and 3125
(l point) l.	n = 16		
(2 points) 2.	$x = -\frac{37}{3}$ or $-12\frac{1}{3}$	3.	l
(3 points) 3.	$y = \frac{11}{4}$ or $2\frac{3}{4}$ or 2.75		
ROUND III		4.	675
(l point) l.	(10111)2		
(2 points) 2.	$\frac{1}{3}$	5.	6 yards
(3 points) 3.	24 km. per hr.		
ROUND IV		6.	y = 2x + 1
(l point) l.	108		
(2 points) 2.	$\frac{n}{9} \left\{ 2ac + 2bc + ab \right\} \text{ or }$ $\frac{2acn + 2bcn + abn}{9} \text{ etc.}$	7.	30
(3 points) 3.	357	8.	7