

March 2, 1977

FRESHMAN WOCOMAL MEET

ROUND III: OPEN

ANSWERS

(1 point) 1. _____

(2 points) 2. _____

(3 points) 3. $d =$ _____

1. The sum of four consecutive integers is 54. What are the integers?

2. Simplify $\frac{\frac{1}{a-1} - 1}{1 + \frac{1}{1-a}}$.

3. A student on vacation d days observed that (1) it rained 7 times, morning or afternoon, (2) when it rained in the afternoon, it was clear in the morning, (3) there were 5 clear afternoons, (4) there were 6 clear mornings. Find d .

March 2, 1977

FRESHMAN WOCOMAL MEET

ROUND IV: NUMBER THEORY

ANSWERS

(1 point) 1. _____

(2 points) 2. _____

(3 points) 3. _____

1. If $x \div 2 \div 3 \div 5 \div 7$ is a whole number, what is the smallest possible value of x ? (The divisions are performed from left to right beginning with the division by 2.)

2. What is the largest prime number that is a factor of 64350 ?

3. Find the sum of the greatest common factor and the least common multiple of the numbers 840 and 126.

March 2, 1977

FRESHMAN WOCOMAL MEET

TEAM ROUND: FACTORING

FACTOR COMPLETELY OVER THE SET OF POLYNOMIALS WITH INTEGER COEFFICIENTS
EACH CORRECT ANSWER IS WORTH TWO POINTS.

1. $kx^3 - kxy^2$ 1. _____

2. $x^2 - 5x - 6$ 2. _____

3. $4 + 400a^2 + 80a$ 3. _____

4. $3a^3b - 12a^2b - 63ab$ 4. _____

5. $21st^5 - 35st^4 + 7st^3$ 5. _____

6. $2(a + 2)^2 + (a + 2) - 10$ 6. _____

7. $2x^{2n} - 2x^n - 12$
(n is a positive integer) 7. _____

8. $2n^2 - c + cn - 2n$ 8. _____

9. $2x^2 + 20xy + 50y^2 - 18w^2$ 9. _____

10. $T^2OI - TICK + TOCK - C^2K^2$ 10. _____

11. $4y^6 + 4 - 4y^4 - 4y^2$ 11. _____

12. Given $y^2 + ky + 14$. Find all integral values of k for which the trinomial can be factored. 12. k = _____

Auburn, Burncoat, Holy Name, Hudson, Marlborough, N. Brookfield, St. Peter-Marian, South, Southbridge, Tantasqua, Wachusett, Ware

March 2, 1977

WOCOMAL FRESHMAN MEET ANSWERS

ROUND I

(1 point) 1. 180 miles

(2 points) 2. 9

(3 points) 3. 24

ROUND II

(1 point) 1. 5

(2 points) 2. 30 or (30,0)

(3 points) 3. $y = -2x + 2$

ROUND III

(1 point) 1. 12, 13, 14, 15

(2 points) 2. -1

(3 points) 3. 9

ROUND IV

(1 Point) 1. 210

(2 points) 2. 13

(3 points) 3. 2562

TEAM ROUND

(2 points for each)

1. $kx(x + y)(x - y)$

2. $(x + 1)(x - 6)$

3. $4(10a + 1)^2$

4. $3ab(a + 3)(a - 7)$

5. $7st^3(3t^2 - 5t + 1)$

6. $a(2a + 9)$

7. $2(x^n + 2)(x^n - 3)$

8. $(2n + e)(n - 1)$

9. $2(x + 5y + 3w)(x + 5y - 3w)$

10. $(TI + CK)(TO - CK)$

11. $4(y^2 + 1)(y + 1)^2(y - 1)^2$

12. $k = 9, -9, 15, -15$