| November 1, 1978 | | WOCOMAL FRESHMAN | | | MEET | | | |
|------------------|----|------------------|-------|----|------------|----|---------|---------|
| ROUND | I: | EVALUATION, | ORDER | OF | OPERATIONS | | | ANSWERS |
| | | | | | | (1 | point) | 1. |
| | | | | | | (2 | points) | 2.(a) |
| | | | | | | | | (b) |
| | | | | | | | | |

(3 points) 3.

1. Let x = -3, z = -2, s = 4 and evaluate the polynomial $\frac{1}{4}z^2 + \frac{1}{2}s^2 - x^2$.

2.(a) Define *, an operation for positive real numbers, as $a * b = \frac{ab}{a + b}$. Evaluate the expression 4 * (4 * 4).

(b) Simplify $3 + 2 \cdot \frac{1}{3} \cdot \frac{6}{5} \div \frac{1}{10} + 28 \div \frac{1}{4}$.

3. Let a * b = ab - b and $c \ddagger d = c + d - \frac{c}{d}$. If a = 2, b = 3, c = 4, $d = \frac{1}{2}$, find $(a * b) \ddagger (c * d)$.

Burncoat Jr., Hudson, Shrewsbury, Wachusett

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ROUND II: LINEAR EQUATIONS

ANSWERS

| (1 | point) | l. <u>x</u> = |
|----|--------|---------------|
| | | |

(2 points) 2.

(3 points) 3. <u>x =</u>

1. If $a \neq c$, solve for x: ax + b = cx + d.

- 2. Identify by letter, a, b, c, d or e, all equations which are identities.
 - a) 4x 3(x 4) + 2 = 5(x 2) + 6x
 - b) 4x 3(x 4) 2 = -5(x 2) + 6x
 - c) 4x 3(x 4) 2 = 5(x 2) 6x
 - d) 4x 3(x + 4) + 2 = 5(x 2) 6x
 - e) -4x + 3(x 4) + 2 = 5(x 2) 6x

3. Solve for x:
$$\frac{54}{x} + 7\frac{1}{2} = \frac{75}{2x} - 3\frac{1}{2}$$

Auburn, Southbridge, Ware, Worcester Academy

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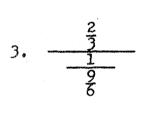
| (1 | point) | 1. |
|----|---------|----|
| (2 | points) | 2. |
| (3 | points) | 3 |

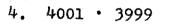
1. What number is that whose double exceeds its half by 45 ?

2. By how much does
$$2^{3^2}$$
 exceed $(2^3)^2$?

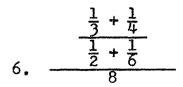
3. If 2137⁷¹¹ is multiplied out, what will be the units digit in the final product?

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|---|---------|
| ROUND IV: NUMERICAL SPEED | ANSWERS |
| SIMPLIFY EACH EXPRESSION COMPLETELY. ANSWERS MUST BE EXACT. EACH QUESTION COUNTS ONE POINT. | 1. |
| | 2. |
| 1. $\frac{[42 - 3(6 + 3 \cdot 2)][39]}{26}$ | 3. |
| | 4. |
| 2. (152 + 278 - 305) • (46 + 239 + 54 + | 61) 5 |
| | 6 |





5. (1.1)⁵



Bromfield, Holy Name, Shrewsbury, Southbridge, Tantasqua, Worcester Academy

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TEAM ROUND: PERCENTAGE WORD PROBLEMS

ANSWERS

- 1. An experimenter planted 105 seeds, of which 84 1. <u>%</u> sprouted. What percent of the seeds <u>failed</u> to sprout?
- 2. A man has \$12,000 to invest. He decides to invest part 2. of the money at 6% and the rest at 7%. How much of the \$12,000 must he invest at 7% to get more than \$750 in interest each year?
- 3. When the base of a triangle is increased 10% and the 3.______ altitude to this base is decreased 10%, find the change in area as a percent. Is this an increase of decrease?
- 4. A baseball team has won 30 of its first 42 games. If 4.______ they win 75% of their remaining games how many more must be played for a final winning percentage of 72% ?
- 6. After working for several months at \$220 a week Mr. Brown was given an increase of 20%. Later, during a slack period, his salary was cut 20%. Mr. Brown's final salary was what percent of his original salary?
- 7. If the length and width of a rectangle were increased by 200% each, the area is increased by what percent?
- 8. Jane invested a certain sum of money on which she received 6% annually. At the end of the year, the interest was credited to her account, thus making her balance \$583. What sum did she invest originally?
- 9. If meat loses 20% of its weight in cooking, how much 9. meat must be cooked to produce 20 kg. of hamburgers?
- 10. On a sale a suit sold for \$110.50. This was 85% of usual price. What was the usual price?
- 11. 54% of some number is the same as 24% of half the number added to 7. What is the number?
- 12. Ed and Jim took a test in math on which Ed scored 90% snd Jim scored 70%. Each question was answered correctly by at least one of the boys and 12 of the problems were answered correctly by both boys. How many problems were on the test?

Bromfield, Grafton, Holy Name, Hudson Catholic, Marlboro, Shrewsbury, South, Tantasqua, Wachusett, Ware, Worcester Academy

9.<u>kg</u>.

6.____%

7. %

8.\$

10.\$_____

11.____

12,

November 1, 1978 WOCOMAL FRESHMAN MEET ANSWERS

| ROUND I | | TEA (2 | <u>M ROUND</u> points each) |
|----------------------------------|---|---|---|
| 1.(1 pt.) | 0 | 1. | 20% |
| 2(a)(1 pt.) (b)(1 pt.) | $\frac{4}{3}$ or $1\frac{1}{3}$ or 1.3 | 2. | more than \$3000 |
| | $\frac{5}{2}$ or $2\frac{1}{2}$ or 2.5 | 3. | decrease 1% |
| ROUND II | | | |
| l.(1 pt.) | $x = \frac{d a b}{a c}$ or $\frac{b d}{c a}$ etc. | 4. | 8 |
| | b, e | 5. | 702 |
| 3.(3 pts.) | $x = -\frac{3}{2}$ or -1.5 | б. | 96% |
| ROUND III | | | |
| 1.(1 pt.) | 30 | 7. | 800% |
| 2.(2 pts.) | 448 | 8. | \$550 |
| 3.(3 pts.) | 3 | | |
| <u>ROUND IV</u> (1 point each | n) | 9. | 25 kg. |
| l. 9 | | 10. | \$130 |
| 2. 50.000 | | 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 | $\frac{50}{3}$ or $16\frac{2}{3}$ or 16.6 or 4 |
| 3. l | | 12, | 20 |
| 4. 15,999 | ,9 99 | | |
| 5. 1.61051 | L | | |
| $6. \frac{7}{64} \text{ or } ($ | 0.109375 | | |