

November 7, 1979

WOCOMAL FRESHMAN MEET

ROUND I: ARITHMETIC - ORDER OF OPERATIONS & EVALUATION

ALL ANSWERS MUST BE IN SIMPLEST EXACT FORM

1. Simplify: $6 \cdot 8 \div 12 + 3 \cdot 24 - 12 \div 6 + 8.$

2. If $a = 2$ and $b = -3$, what is $\frac{a - 2b}{a + b}$?

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

ANSWERS: (1 point) 1. _____

(2 points) 2. _____

(3 points) 3. _____

Algonquin, Auburn, Hudson

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ROUND II: SOLVING LINEAR EQUATIONS WITH ONE VARIABLE

1. Solve for x: $3 - [3 - (3x - 3)] = 3$

2. Solve for y: $ay = \frac{b}{2}(y + 3)$

3. Solve for x: $6 - 5 \cdot [4 - 3(2 - x)] = [(x - 2) \cdot 3 - 4] \cdot 5 - 6$

4. Solve for t: $\frac{3t}{4} - \frac{t + 1}{2} = \frac{5t - 5}{3}$

ANSWERS: (1 point) 1. x =

(1 point) 2. y =

(2 points) 3. x =

(2 points) 4. t =

St. John's, Shrewsbury, Worcester Academy

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ROUND III: OPEN

1. Find the smallest possible integer which is divisible by 1, 2, 3, 4, 5, 6, and 7.
2. If x and y are positive integers solve for $x + y$:
 $15x + 7y = 101$.
3. A straight road has six sets of traffic lights. For each light the green light lasts for 2 minutes, the yellow for 5 seconds, and the red for 2 minutes. The lights are synchronized so that each light changes to red 10 seconds after the preceding one. For how many seconds will all six lights be simultaneously green?
How long is the longest ^{span of} time during which all lights are colored green?

ANSWERS: (1 point) 1. _____

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

(3 points) 3. _____ seconds

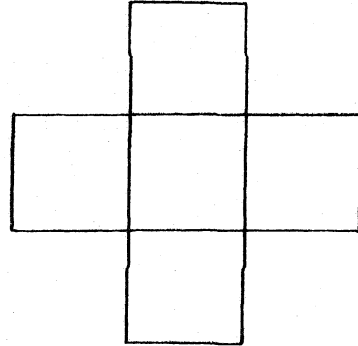
Bromfield, Hudson, Hudson Catholic

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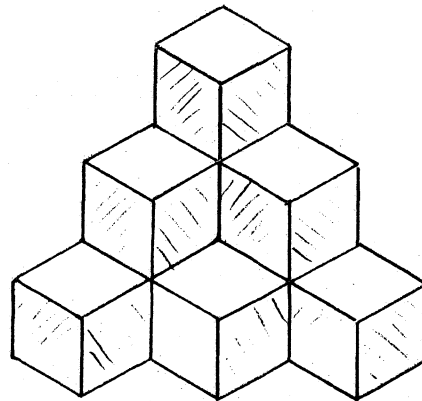
ROUND IV: PERIMETER & AREA OF PLANE FIGURES; VOLUME OF RECTANGULAR SOLIDS

1. The perimeter of the figure formed by five squares is 84 centimeters. find its area.



2. A man traded a triangular piece of land for a rectangular piece with twice the area of the ~~tri~~^{tri}angular piece. If the area of the rectangular piece was 96 square kilometers, find the height of the triangular shaped lot. The height of the triangle equals $\frac{2}{3}$ of its base.

3. This neat stack contains 10 cubes each of volume 8. Four cubes are hidden. The other three surfaces which are not visible each lie in one plane. Find the total surface area, including the surfaces that cannot be seen.



ANSWERS: (1 point) 1. _____ Sq. Cm.

(2 points) 2. _____ Km.

(3 points) 3. _____

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TEAM ROUND: PERCENTS AND PERCENTAGE WORD PROBLEMS

1. A house is purchased for \$36,000. The buyer then sold it for \$49,500. What percent profit did he make? 1. _____ %
2. The width of a river is 760 meters at the point where it is spanned by a bridge. 20% of the bridge is on one side of the river; $16\frac{2}{3}\%$ of the bridge is on the other side of the river. How long is the bridge? 2. _____ m.
3. "WOCOMAL" and one third of "WOCOMAL" is what percent of one third of "WOCOMAL"? 3. _____ %
4. A saleswoman buys an article for \$12.00 and marks the item at \$22.00. At what percent can she put the item on sale so she would still realize a 10% profit? 4. _____ %
5. If fruit loses $62\frac{1}{2}\%$ of its weight in drying, how many pounds of fresh fruit will be necessary to make 420 pounds of dried fruit? 5. _____ lbs.
6. $83\frac{1}{3}\%$ of 18 is what percent of 3750? 6. _____ %
7. A real estate dealer sold two houses at \$48,000 each. Based on the cost the profit on one was 20% and the loss on the other was 20%. Overall, did the dealer make money or lose money and how much? 7. _____
8. I invested \$900 for one year. At the end of the year I received \$65.25 in interest. What was the rate of interest? 8. _____ %

Algonquin, Hudson, Marlboro, Quaboag, St. John's,
Shepherd Hill, Southbridge, Wachusett

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WOCOMAL FRESHMAN MEET ANSWERS

TEAM ROUND
(3 points each)

ROUND I

- (1 point) 1. 82
(2 points) 2. -8
(3 points) 3. $\frac{22}{3}$ or $7\frac{1}{3}$ or $7.\bar{3}$

ROUND II

- (1 point) 1. $x = 2$
(1 point) 2. $y = \frac{3b}{2a - b}$
(2 points) 3. $x = \frac{12}{5}$ or $2\frac{2}{5}$ or 2.4
(2 points) 4. $t = \frac{14}{17}$ or 0.8235294117647058

ROUND III

- (1 point) 1. 420
(2 points) 2. $x + y = 11$
(3 points) 3. 70 seconds

ROUND IV

- (1 point) 1. 245 Sq. Cm.
(2 points) 2. 8 Km.
(3 points) 3. 144

1. $37\frac{1}{2}\%$ or 37.5%

2. 1200 meters

3. 400%

4. 40%

5. 1120 lbs.

6. 0.4% or $\frac{2}{5}\%$

7. \$4000 loss

8. $7\frac{1}{4}\%$ or 7.25%