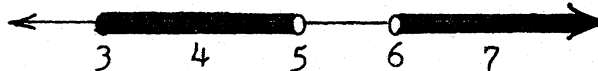


January 14, 1981

WOCOMAL FRESHMAN MEET

ROUND I: GRAPHING ON THE NUMBER LINE

ON THE NUMBER LINES BELOW DRAW THE GRAPHS OF THE SOLUTIONS OVER THE SET OF REAL NUMBERS FOR THE FOLLOWING OPEN SENTENCES. USE THIS NOTATION FOR $3 \leq x < 5$ or $x > 6$:

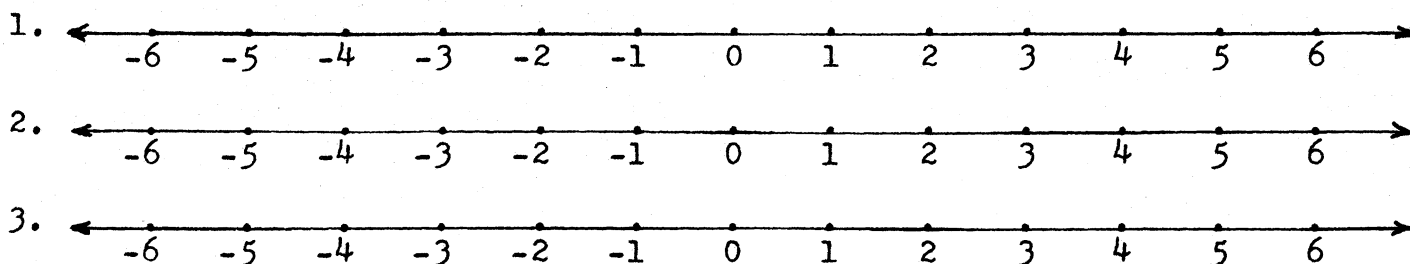


(1 point) 1. $\{x: x \geq 0\} \cap \{x: x < 3\}$

(2 points) 2. $|x - 3| < 3$

(3 points) 3. $|5 - 2x| > 3x - 10$

ANSWERS:



St. John's, Shepherd Hill, Tantasqua

January 14, 1981

WOCOMAL FRESHMAN MEET

ROUND II: SET THEORY

1. Given: $U = \{1, 2, 3, 4, 5\}$, $A = \{1, 3\}$, $B = \{1, 2, 4\}$.
If U is the universe set and \bar{A} is the complement of set A ,
find $\bar{A} \cup B$.

2. Given: Set $A = \{2, 3, 5, 7, 11\}$
 $A \cap B = \{2, 3, 5\}$
 $A \cup B = \{1, 2, 3, 4, 5, 7, 11\}$

List the elements in set B .

3. Let $A = \{1, 2, 3, 4, \dots, 10\}$, $B = \{6, 7, 8, 9, 10, 11, 12\}$ and
 $C = A \cap B$. How many subsets of C have exactly three elements?

ANSWERS: (1 point) 1. $\{\underline{\hspace{2cm}}\}$

(2 points) 2. $\{\underline{\hspace{2cm}}\}$

(3 points) 3. $\underline{\hspace{2cm}}$

Auburn, Bromfield, Marlboro

January 14, 1981

WOCOMAL FRESHMAN MEET

ROUND III: OPEN

ALL ANSWERS MUST BE IN SIMPLEST EXACT FORM

1. Arrange in ascending order from smallest to largest;

$$\sqrt{2}, \frac{8}{3}, \frac{\pi}{3}, \frac{2\sqrt{3}}{3}$$

2. In the binary (base 2) number system you would find $11111010_{(2)}$ as a number. Write the same amount as a quinary (base 5) number.

3. A face cream contains 3 ounces of glycerine in each 8 ounces of cream. How many ounces of glycerine would there be in 3 ounces of the cream?

ANSWERS: (2 points) 1. _____

(2 points) 2. _____

(2 points) 3. _____ ounces

St. John's, Shepherd Hill, Tantasqua

January 14, 1981

WOCOMAL FRESHMAN MEET

ROUND IV: OPERATIONS ON NUMERICAL FRACTIONS & DECIMALS

EXPRESS EACH ANSWER AS A FRACTION REDUCED TO SIMPLEST FORM.

1. Simplify the expression: $1 - \frac{1}{2 - \frac{1}{3}}$

2. If John can pick $\frac{1}{2}$ liter of berries in one hour, and Mary can pick $\frac{2}{3}$ liter in one hour, how long will it take them working together to pick 5 liters?

3. $X = A\left(\frac{1}{B} + \frac{1}{C} + \frac{1}{K}\right)$

If $A = 0.1$, $B = 0.2$, $C = 0.3$, $K = 0.4$, solve for X .

ANSWERS: (1 point) 1. _____

(2 points) 2. _____ hours

(3 points) 3. _____

Marlboro, Quaboag, Shrewsbury

January 14, 1981

WOCOMAL FRESHMAN MEET

TEAM ROUND: PERCENT AND PERCENTAGE WORD PROBLEMS

EXPRESS EACH ANSWER IN SIMPLEST EXACT FORM UNLESS TOLD OTHERWISE

1. If a store offers successive discounts of 10% for each of 4 weeks on an item originally marked \$99.00, find the new sale price (to the nearest penny). 1. \$ _____
2. Mr. and Mrs. Jones were looking at floor plans for a small restaurant with dining area 28 meters by 50 meters. If their plans were changed to dimensions of 30 meters by 56 meters, by what percent was the floor area increased? 2. _____ %
3. If $12\frac{1}{2}\%$ of x is 16, $16\frac{2}{3}\%$ of y is 4, and 225% of z is 90, find 50% of $(\frac{x}{y+z})$. 3. _____
4. Jack climbed at a uniform rate up the beanstalk. At 2 o'clock he was $16\frac{2}{3}\%$ of the way up and at 4 o'clock he was 75% of the way up. Find the fraction of the stalk that Jack had climbed at 3 o'clock. 4. _____
5. Howie's father was given a 10% increase in salary last year. Recently his salary was reduced by 10%. The salary he now receives is what percent of his salary before he had been given the raise? 5. _____ %
6. Suppose you have \$5000 to invest. The savings bank is offering 5% annual interest and municipal bonds pay $8\frac{1}{2}\%$ annual interest. How much would you have to invest in bonds to make exactly \$302.50? 6. \$ _____
7. What is the single discount equivalent to successive discounts of 10%, 20%, and 10%? 7. _____ %
8. A hobbins and a bobbins and a quarter robins is what percent of a bobbins if
4 hobbins = bobbins
24 bobbins = robins 8. _____ %

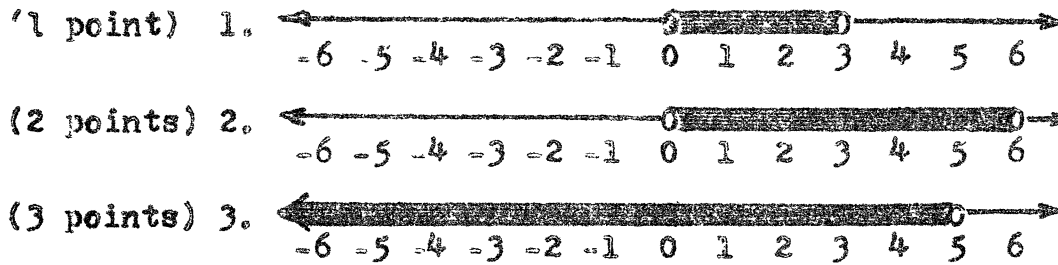
Auburn, Bromfield, Hudson, Hudson Catholic, Quaboag,
Southbridge, Worcester Academy

January 14, 1981

WOCOMAL FRESHMAN MEET ANSWERS

ROUND I

TEAM ROUND
3 points each



1. \$64.95

2. 20%

ROUND II

- (1 point) 1. {1, 2, 4, 5}
- (2 points) 2. {1, 2, 3, 4, 5}
- (3 points) 3. 10

3. 1

4. $\frac{11}{24}$

5. 99%

ROUND III

- (2 points) 1. $\frac{\pi}{3}$, $\frac{2\sqrt{3}}{3}$, $\sqrt{2}$, $\frac{8}{5}$
- (2 points) 2. 2000(5)
- (3 points) 3. $\frac{9}{8}$ or $1\frac{1}{8}$ or 1.125 ounces

6. \$1500

7. $35\frac{1}{5}$ or 35.2%

ROUND IV

- (1 point) 1. $\frac{2}{5}$
- (2 points) 2. $\frac{30}{7}$ or $4\frac{2}{7}$ hours
- (3 points) 3. $\frac{13}{12}$ or $1\frac{1}{12}$

8. 725%