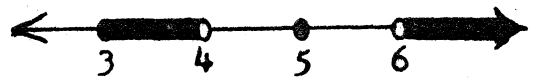


January 9, 1985

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 $3 \leq x < 4$ or $x = 5$ or $x > 6$:

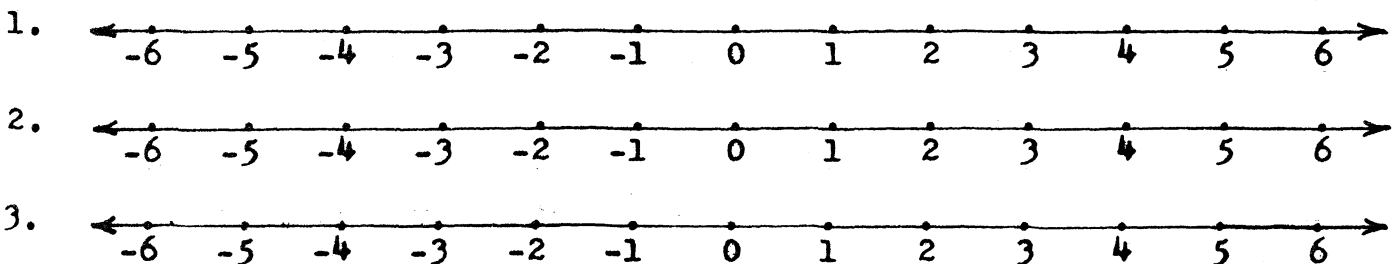


(1 point) 1. $-4 < |x| < 1$

(2 points) 2. If $-1 < 3x - 4 \leq 8$, draw the graph of the solution set over the set of integers.

(3 points) 3. $\{x: |2x - 5| > 3\} \cup \{x: 5(x - 3) < 5\}$

ANSWERS:



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ROUND II: SET THEORY

U IS THE UNIVERSAL SET, \emptyset IS THE EMPTY SET AND \bar{A} IS THE COMPLEMENT OF SET A. ALL ANSWERS MUST BE EXPRESSED IN SIMPLEST FORM.

1. If $A = B$, simplify $(A \cap B) \cap (A \cap \emptyset)$.

2. If $U = \{0, 1, 2, \dots, 9\}$, $A = \{0, 1, 2, 3, 4, 5, 6\}$ and $B = \{0, 2, 4, 6, 8\}$, find $(A \cup B) \cap (\overline{A \cap B})$.

3. If $A = \{1, 2, 4, 5, 10\}$, $B = \{1, 6, 7, 9\}$, $C = \{1, 2, 3, 6, 8\}$ and $\overline{A \cup B \cup C} = \emptyset$, find $\overline{\overline{B} \cup C}$.

ANSWERS: (1 point) 1. _____

(2 points) 2. { _____ }

(3 points) 3. { _____ }

Quaboag, Shepherd Hill, Worcester Academy

January 9, 1985

WOCOMAL FRESHMAN MEET

ROUND III: OPEN

ALL ANSWERS MUST BE IN SIMPLEST EXACT FORM

1. Find the two smallest positive numbers whose sum is an even integer and whose difference is an odd integer.
2. A retired principal lived $\frac{1}{7}$ of his life as a boy and $\frac{1}{6}$ of his life as a young man. He then spent $\frac{1}{2}$ of his life as an educator and the remaining 16 years on pension. How old was he when he died?
3. Mr. Sullivan has a 1¢, a 2¢, a 5¢, and a 10¢ stamp. What is the total number of non-zero amounts of money in stamps which can be formed from one or more of these stamps?

ANSWERS: (2 points) 1. _____

(2 points) 2. _____

(2 points) 3. _____

Auburn, Hudson, Notre Dame

January 9, 1985

WOCOMAL FRESHMAN MEET

ROUND IV: OPERATIONS ON NUMERICAL FRACTIONS & DECIMALS

ALL ANSWERS MUST BE IN SIMPLEST EXACT FORM

1. If $A = 0.474747\dots$ and $B = 0.747474\dots$, find an infinitely repeating decimal for the sum $A + B$.
2. A tank is $\frac{1}{2}$ full of oil. After $\frac{1}{3}$ of this oil is removed, 24 quarts remain in the tank. How many quarts of oil does the entire tank hold?

3. Simplify:
$$\frac{.01 - \frac{.1\bar{6}}{.3}}{\frac{.75}{25} - \frac{1}{10}}$$

ANSWERS: (1 point) 1. _____

(2 points) 2. _____ qts.

(3 points) 3. _____

January 9, 1985

WOCOMAL FRESHMAN MEET

TEAM ROUND: PERCENT AND PERCENTAGE WORD PROBLEMS

EXPRESS EACH ANSWER IN SIMPLEST EXACT FORM

ANSWERS
(3 points each)

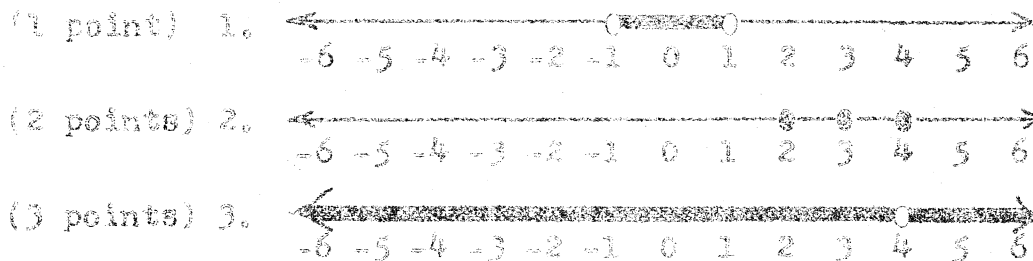
1. Express $\frac{3}{4}\%$ as a fraction in lowest terms. 1. _____
2. How much interest is earned on a 90-day deposit in the amount of \$2500 paying 10.95%. 2. \$ _____
3. If 10% of Q is W and Q is 20% of X, then W is what % of X? 3. _____ %
4. 80% of the students in the 9th grade of Superkid High participate in an after school activity. Of these students, 50% participate in sports. 25% of the student athletes also belong to the math team. If 14 9th graders belong to the math team, how many 9th graders are at Superkid High? 4. _____
5. If the cost of an article is 25% of the selling price and the profit is \$3, what is the selling price? 5. \$ _____
6. What is the single discount, to the nearest percent, equivalent to four successive discounts of 10%, 20%, 30% and 40% ? 6. _____ %
7. Six years ago a calculator sold for \$58.00. This year it is selling for \$23.20. Find the percent of decrease. 7. _____ %
8. A car salesman eager to sell his old stock decides to decrease the price of each car by 10%. He then realizes that he will have a loss at these new prices and increases the new price by 5%. What is his net discount? 8. _____ %

Assabet Valley, Bartlett, Bromfield, Hudson, St. John's, Shepherd Hill, Shrewsbury, Tantasqua

January 9, 1985

WOODMALL FRESHMAN MEET ANSWERS

ROUND I



TEAM ROUND
(3 points each)

1. $\frac{3}{400}$
2. \$67.50
3. 2%

ROUND II

- (1 point) 1. \emptyset or $\{ \}$
- (2 points) 2. $\{1, 3, 5, 8\}$
- (3 points) 3. $\{7, 9\}$

4. 140

ROUND III

- (2 points) 1. $\frac{1}{2}$ and $1\frac{1}{2}$ or 0.5 and 1.5
- (2 points) 2. 64
- (2 points) 3. 15

5. \$4

6. 70%

ROUND IV

- (1 point) 1. 1.2222... or $1.\bar{2}$
- (2 points) 2. 72 qts.
- (3 points) 3. 7

7. 60%

8. 5.5%