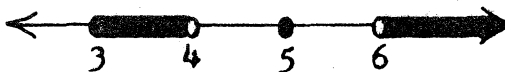


January 11, 1984

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  $x > 6$ :

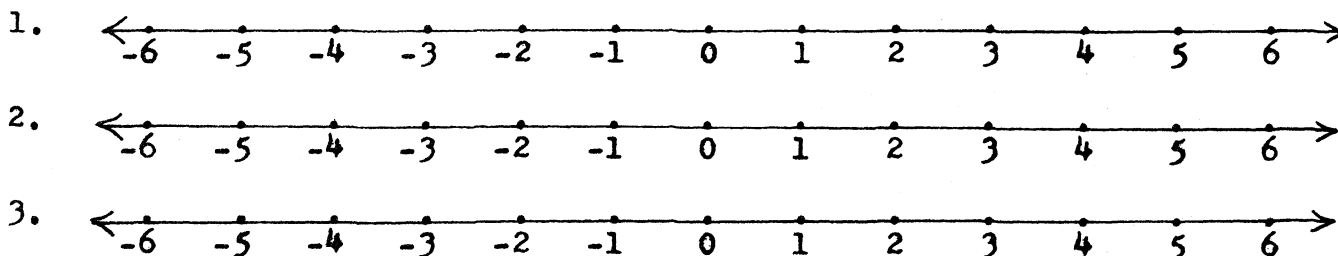


(1 point) 1.  $|x| > -x.$

(2 points) 2.  $|2x - 3| \geq 1.$

(3 points) 3.  $-x + 2 \leq 3x - 2 \leq 2x + 3$  and  $|x - 3| \geq 2.$

ANSWERS:



January 11, 1984

WOCOMAL FRESHMAN MEET

ROUND II: LOGIC PROBLEMS

ALL ANSWERS MUST BE IN SIMPLEST EXACT FORM

1. How many gallons of gasoline will I need for a 200 mile trip if my car used 7 gallons to go  $87\frac{1}{2}$  miles?
2. There are four blue socks, seven green socks, five white socks, and eight gray socks in a drawer. Without looking, one sock at a time is drawn from the drawer and not replaced. What is the minimum number of socks which must be taken from the drawer to be absolutely certain that you have a matching pair?
3. Looking at the coins in my pocket, I noticed that I could pay the exact price for any item from one cent up to and including one dollar without receiving any change. What is the fewest number of coins (pennies, nickels, dimes, quarters and half-dollars) I could have had in my pocket?

ANSWERS: (2 points) 1.           gallons

(2 points) 2.           socks

(2 points) 3.           coins

Auburn, Bromfield, Notre Dame

January 11, 1984

WOCOMAL FRESHMAN MEET

ROUND III: OPEN

ALL ANSWERS MUST BE IN SIMPLEST EXACT FORM

1. Three less than two-thirds of a number is -15. What is the number?

2. If each base angle of an isosceles triangle measures  $20^\circ$  less than twice the vertex angle, find the measure of the base angles.

3. If  $r$  and  $s$  represent integers, use the letters A, B, C, D and E to arrange in order, from the smallest to the largest:

A:  $\frac{r}{s}$

B:  $\frac{r + 1}{s - 1}$

C:  $\frac{r - 1}{s + 1}$

D:  $\frac{r}{s - 1}$

E:  $\frac{r}{s + 1}$

ANSWERS: (1 point) 1. \_\_\_\_\_

(2 points) 2. \_\_\_\_\_

(3 points) 3. \_\_\_\_\_

St. John's, Shrewsbury, Southbridge

January 11, 1984

WOCOMAL FRESHMAN MEET

ROUND IV: OPERATIONS ON NUMERICAL FRACTIONS & DECIMALS

WRITE EACH OF THE FOLLOWING EXPRESSIONS AS AN INTEGER OR AS A FRACTION REDUCED TO SIMPLEST EXACT FORM:

1. 
$$\frac{\frac{2}{3} - \frac{3}{8}}{\frac{5}{6} + \frac{1}{3}}$$

2. 
$$4 + \frac{5}{2 + \frac{1}{2 + \frac{1}{3}}}$$

3. 
$$\frac{1.0\overline{6} \div 15}{\frac{1}{3} - \frac{2}{11} + .0\overline{1}}$$

ANSWERS: (1 point) 1. \_\_\_\_\_

(2 points) 2. \_\_\_\_\_

(3 points) 3. \_\_\_\_\_

January 11, 1984

WOCOMAL FRESHMAN MEET

EAM ROUND: PERCENT AND PERCENTAGE WORD PROBLEMS

EXPRESS EACH ANSWER IN SIMPLEST EXACT FORM

ANSWERS  
(3 points each)

1. Fill in the blanks:

a)  $130\%$  of  $60 = \underline{\quad ? \quad}$

1.a) \_\_\_\_\_

b)  $\frac{2}{9}\%$  of  $\underline{\quad ? \quad} = \frac{5}{6}$

b) \_\_\_\_\_

c)  $\underline{\quad ? \quad}\%$  of  $16 = 5.6$

c) \_\_\_\_\_

2. Mrs. Brown received \$7140 as commission when she sold a house. The seller received \$18360 for their house. What percent of the amount the buyers paid did Mrs. Brown receive?

2. \_\_\_\_\_ %

3. Find all positive integers  $q$  such that  $q$  is  $q\%$  of  $q^2$ .

3. \_\_\_\_\_

4. A man borrowed \$4000 from a bank on Sept. 1, 1980 and paid it back with interest at  $10\%$  simple interest on June 1, 1982. How much interest did he pay back?

4. \$ \_\_\_\_\_

5. What single discount is equivalent to successive discounts of  $10\%$  and  $20\%$ ?

5. \_\_\_\_\_ %

6. If the radius of a circle is doubled, by what percent is its area increased?

6. \_\_\_\_\_ %

7. Kerry owns  $48\%$  of a store and sells  $83\frac{1}{3}\%$  of her share for \$10000. What is the value of the store?

7. \$ \_\_\_\_\_

8. A merchant pays \$1200 for one hundred calculators. How much should he sell each of them for so that he can give twenty away free and still make a profit of  $10\%$  on his investment?

8. \$ \_\_\_\_\_

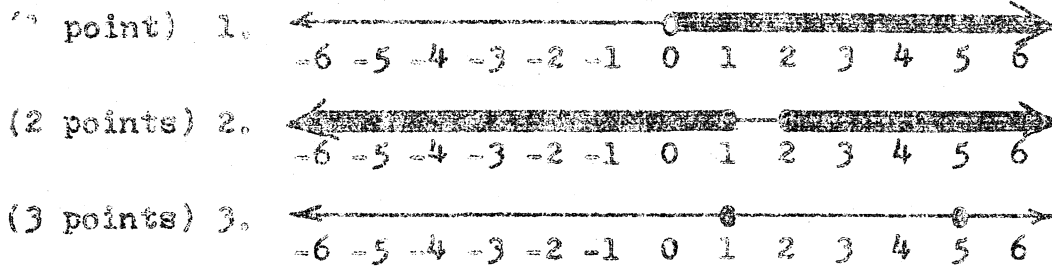
Cartlett, Hudson, Leicester, Notre Dame, Quaboag,  
St. John's, Shepherd Hill, Worcester Academy

January 11, 1984

WOCOMAL FRESHMAN MEET ANSWERS

ROUND I

TEAM ROUND  
(3 points each)



- 1.a) 78
- b) 375
- c) 35

(1 point for each part)

ROUND II

- (2 points) 1. 16 gallons
- (2 points) 2. 5 socks
- (2 points) 3. 9 coins

- 2. 28%
- 3. 10
- 4. \$700

ROUND III

- (1 point) 1. -18
- (2 points) 2. 68 or 68°
- (3 points) 3. C, E, A, D, B

- 5. 28%
- 6. 300%

ROUND IV

- (1 point) 1.  $\frac{1}{4}$
- (2 points) 2.  $\frac{55}{59}$
- (3 points) 3. 1

- 7. \$25,000
- 8. \$16.50