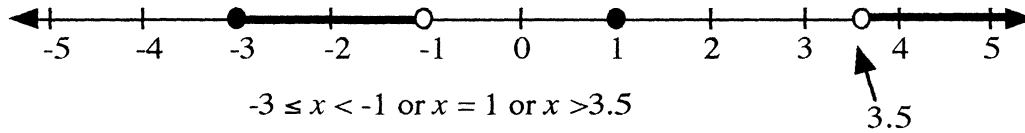


ROUND I: Graphing on the Number Line - inequalities, absolute value

Draw the graph for each problem on the number line provided.  
Specify any non-integer endpoints.

Use notation like this for your graphs:

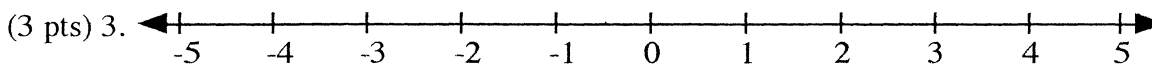
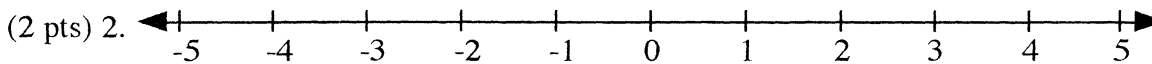
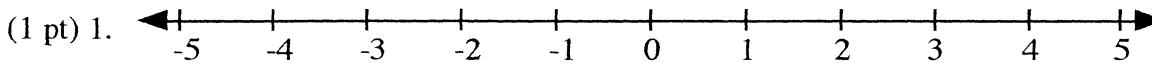


1.  $2(1.5 - 4x) < 3(1 - 3x)$

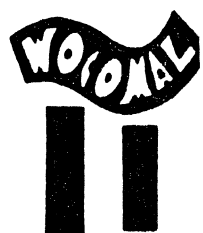
2.  $2 - 3x > 5$  and  $2x - 1 > -5$

3.  $0 < |x + 2| \leq \frac{2}{3}$

ANSWERS



Algonquin, Bromfield, Holy Name



January 8, 1997

WOCOMAL FRESHMAN MEET

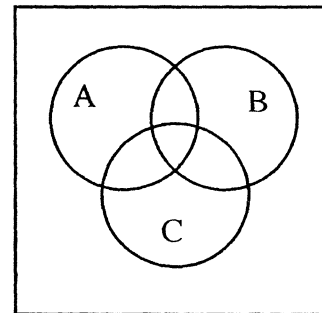
ROUND II: Set theory

Note:  $\bar{A}$  denotes the complement set of A.

1. 20 girls are on the cross country team, 19 are on the basketball team, 5 are on both. How many are on at least one of the teams?

2. On the Venn Diagram like this in the answer section shade

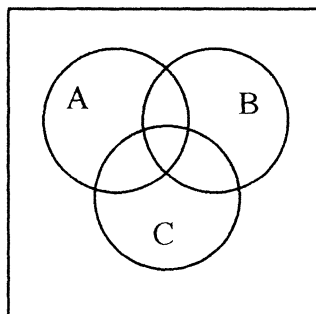
$$\overline{(A \cup B)} \cup C$$



3. A set S of six elements contains  $a$ ,  $b$ ,  $c$ , and  $x$ . How many subsets of S contain at least one of  $a$ ,  $b$ , and  $c$ , but not  $x$ ?

ANSWERS

(1 pt) 1. \_\_\_\_\_



(2 pts) 2. \_\_\_\_\_

(3 pts) 3. \_\_\_\_\_

Auburn, Doherty, Worcester Academy

January 8, 1997

WOCOMAL FRESHMAN MEET

ROUND III: Operations on numerical fractions, decimals, percents, and percentage word problems.

1. Express  $\frac{5}{10} + \frac{4}{10^2} + \frac{3}{10^3} + \frac{2}{10^4} + \frac{1}{10^5}$  as one fraction.

2. Cheery and Web is having a 25% off sale on everything in the store. Karlene buys a skirt that is already marked down 15%. If Karlene pays \$25.50, what was the original price of the skirt?

3. The following results were obtained from a medical study of an experimental drug:  
81% of patients had no side effects  
6% had headaches  
12% felt a burning sensation  
11% had sore throats

If 120 people had headaches, how many people had more than one side effect?

ANSWER

(1 pt) 1. \_\_\_\_\_

(2 pts) 2. \_\_\_\_\_

(3 pts) 3. \_\_\_\_\_

Algonquin, Bartlett, Tahanto

January 8, 1997

WOCOMAL FRESHMAN MEET

ROUND IV: Techniques of counting and probability

ALL ANSWERS MUST BE EXPRESSED AS SINGLE POSITIVE INTEGERS OR REDUCED FRACTIONS

1. There are 20 jelly beans in a bag. 6 are red, 4 green, 3 white, and 7 orange. If you pick one at a time, without looking, and don't return it, how many times must you pick to be sure of getting two of the same color?
  
2. There are 26 cards in a box each with a different letter of the alphabet written on it. Determine the probability of picking one of the letters of WOCOMAL by drawing one card at random. Give your answer as a reduced fraction.
  
3. How many 3-digit numbers can be formed from the digits 0, 1, 2, 3, and 4 if no repetitions are allowed? (021, for example, is also not allowed)

ANSWER

(1 pt) 1. \_\_\_\_\_

(2 pts) 2. \_\_\_\_\_

(3 pts) 3. \_\_\_\_\_

Algonquin, Bancroft, Shrewsbury

January 8, 1997

WOCOMAL FRESHMAN MEET

TEAM ROUND: Topics of previous rounds and open.

ALL ANSWERS MUST BE IN SIMPLEST EXACT FORM AND ON THE SEPARATE  
TEAM ANSWER SHEET

3 Pts. Each

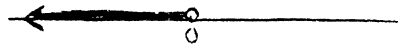
1. Graph the solution to this inequality:  $\left| \frac{3-x}{4} \right| < 6$   
You must include relevant coordinates.
2. Let  $A = \{ 3, 6, 9, 12 \}$ ,  $B = \{ 3, 4, 5, 6 \}$ ,  $C = \{ 4, 6, 8, 10, 12 \}$ , and the universe be  $A \cup B \cup C$ . Determine  $\left[ \overline{(A \cup B)} \cap (B \cup C) \right] \cap (A \cap B)$ .
3. Mr. Minimum's yearly salary increased by 10% at the beginning of 1994. In 1995 his salary decreased by 5% from that in 1994. If he made \$13,062 in 1995, what was his salary in 1993? Round to the nearest dollar.
4. Students having pets were asked what kind of pet they had. 28 had a dog, 15 had a cat, and 8 of these had both a cat and a dog. In percent form, what is the probability that a randomly selected student from this group has only a cat?
5. The length of one leg of a right triangle is 5 feet longer than the other leg. If each leg is decreased by 5 feet, the area of the resulting right triangle is 1000 square feet less than the area of the original triangle. Find the length of the shorter leg of the original triangle.
6. Find a two digit number with all these properties: first digit larger than the second, the difference between the digits greater than three, a multiple of seven, sum of the digits greater than ten.
7. If  $3^x = 5$ , evaluate  $3^{2x+3}$
8. 3 goats and 3 sheep ate 1 hectare in 4 days. 2 goats and 5 sheep ate 2 hectares in 7 days. At these rates, in how many days would 5 goats and 8 sheep eat 3 hectares?

Auburn, Shepherd Hill, Shrewsbury, South, Westboro, Worcester Academy

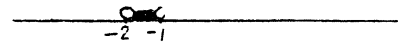
January 8, 1967

WOCOMAL Freshman meet answers

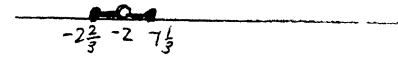
ROUND I 1 pt 1.



# line graphs 2 pts 2.



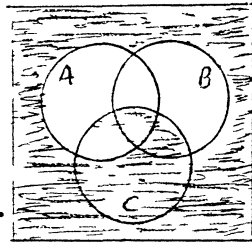
3 pts 3.



ROUND II 1 pt 1.

34

SETS



2 pts 2.

3 pts 3.

28

ROUND III 1 pt 1.

$$\frac{54321}{100000} \approx \frac{54321}{10^5}$$

fract.  
dec.  
 $\frac{1}{10}$

2 pts 2.

\$40

3 pts 3.

200

ROUND IV 1 pt 1.

5

counting  
prob.

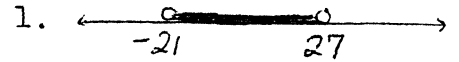
2 pts 2.

$\frac{3}{13}$

3 pts 3.

48

TEAM ROUND 3 pts each



2.  $\phi$  or  $\{ \}$  an empty set

3. \$12,500

4. 20%

5. 200 ft

6. 84

7. 675

8.  $5\frac{3}{5}$  or 5.6