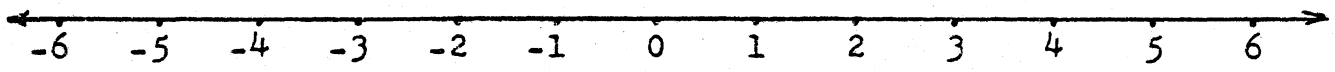
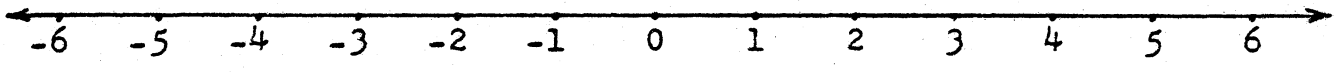
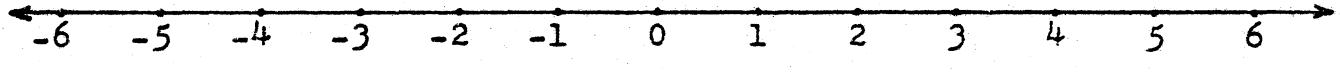
January 12, 1977 WOCOMAL FRESHMAN MEET

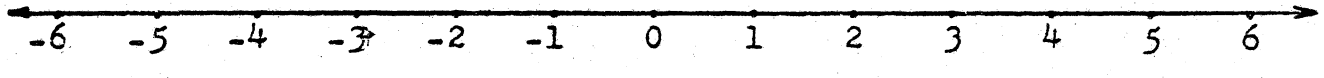
ROUND I: GRAPHING ON THE NUMBER LINE

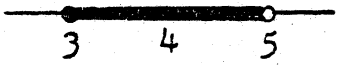
ANSWERS

1. 

2. 

3. 

4. 

ON THE NUMBER LINES ABOVE DRAW THE GRAPHS OF THE SOLUTION SETS OVER THE SET OF REAL NUMBERS FOR THE FOLLOWING OPEN SENTENCES. USE THIS NOTATION FOR $3 \leq x < 5$ 

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1. (1 point) $3x - 5 \geq 4$

2. (1 point) $2 < x + 3 \leq 7$

3. (1 point) $|-x| \leq 0$

4 (3 points) $1 < |2x - 3| < 5$

Auburn, Burncoat, Marianhill, St. Peter Marian

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ROUND II: AREA OF PLANE FIGURES; VOLUME OF SPHERES, CYLINDERS, RECTANGULAR SOLIDS

ANSWERS

(1 point) 1. _____

(1 point) 2. _____ cu.cm.

(2 points) 3. _____ cu.cm.

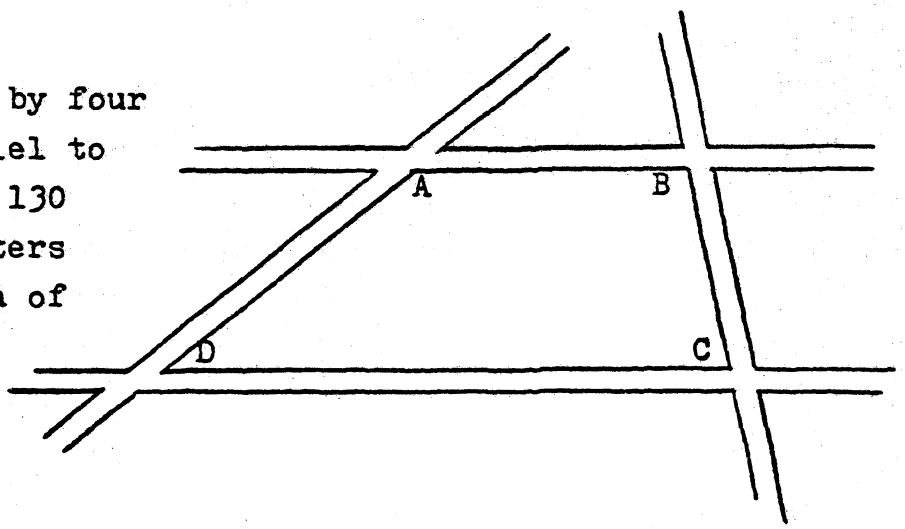
(2 points) 4. _____ sq.m.

1. The diameters of two circles are 8 cm. and 12 cm., respectively. The area of the larger circle is how many times the area of the smaller circle? The answer must be in simplest exact form.

2. What is the volume of a shoe box that has a length of 24 cm., a width half of the length, and a height 3 cm. greater than the width?

3. What is the volume of a cube if its total surface area is 96 square centimeters?

4. ABCD is a lot surrounded by four streets. If $\overline{AB}$ is parallel to $\overline{DC}$, AB = 60 meters, DC = 130 meters, and $\overline{AB}$ is 40 meters from $\overline{CD}$, what is the area of ABCD in square meters?



Holy Name, Shrewsbury, Southbridge, Wachusett

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ROUND III: OPEN

ANSWERS

(1 point) 1. _____°

(1 point) 2. _____%

(2 points) 3. f(h(g(3))) = _____

(2 points) 4. _____ Flinks

1. Thermometers A and B each have different scales. They both read 0° at the same time but thermometer A reads 50° when B reads 45°. What will B read when A reads 30°?

2. A certain factory produced 1605 units last month and 1284 units the month before. What was the per cent of increase in production?

3. Given: $f: x \longrightarrow x^2 - 5$

$h: x \longrightarrow \left(\frac{x+1}{2}\right)^2$

$g: x \longrightarrow x^2 + x - 7$

Find $f(h(g(3)))$.

4. If 3 Pinkos are worth 7 Blitzes,
5 Blitzes are worth 8 Plimskies, and
4 Plimskies are worth 9 Flinks,
then how many Flinks are 4 Pinkos worth? (Give exact answer)

Auburn, Burncoat, Tantasqua, Ware

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ROUND IV: OPERATIONS ON NUMERICAL FRACTIONS ANSWERS

(1 point) 1. _____ k.p.h.

(2 points) 2. _____

(3 points) 3. _____

ALL ANSWERS MUST BE WHOLE NUMBERS OR FRACTIONS REDUCED TO LOWEST TERMS.

1. An airplane traveled 1800 kilometers in 3 hours 20 minutes. What was the average rate of speed in kilometers per hour for this trip?

2. Simplify: $\left\{\left[\left(\frac{6}{21}\times\frac{15}{12}\right) \div 2\frac{1}{7}\right] + \frac{2}{3}\right\} - \frac{5}{18}$

3. Write as an improper fraction: $1 + \cfrac{1}{2 + \cfrac{1}{3 + \cfrac{1}{4 + \cfrac{1}{5 + 1}}}}$

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TEAM ROUND: OPERATIONS ON POLYNOMIALS

UNLESS INSTRUCTED DIFFERENTLY, IN EACH PROBLEM PERFORM THE INDICATED OPERATIONS AND SIMPLIFY THE ANSWER TO A NUMBER OR A POLYNOMIAL.

ANSWERS
3 POINTS EACH

1. $-4[x + 5(-3xy + x)] + (-1)(10 + 15xy)$ 1. _____

2. $(x^2 + 5)^2 - (x^2 - 3x + 5)^2$ 2. _____

3. If $60x^2 + 20x$ represents the distance traveled by Janet, represent in simplest form the number of miles per hour she traveled if the number of hours she traveled was $3x + 1$. 3. _____

4. $(2x+3y)(y+7) + (2x+3y)(3y-2) - (2x+3y)(4y+4)$ 4. _____

5. Find the dividend when the quotient is $x - 1$, the remainder is 2, and the divisor is $3x - 1$. 5. _____

6. $(2x-3y)^2 - (8x^3-36x^2y+54xy^2-27y^3) \div (2x-3y)$ 6. _____

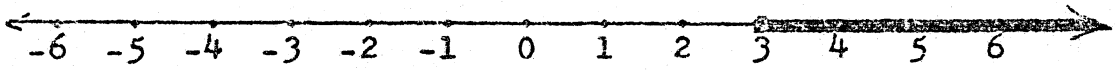
7. Find the sum of the lengths of the 12 edges of the rectangular solid whose length = $2x + y$, width = $x + 2y$, and height = $x - 2y$. 7. _____

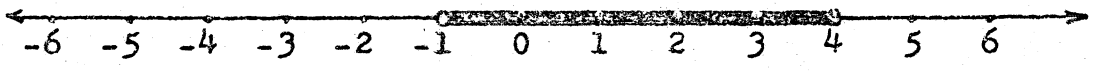
8. If $A * B = \frac{A^2 + B^2 - 1}{(A)(B)}$, find $(x - 2) * (x - 3)$. 8. _____

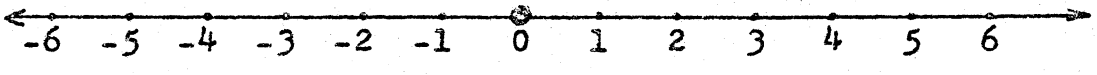
Auburn, Burncoat, Holy Name, Hudson, Southbridge, Tantasqua

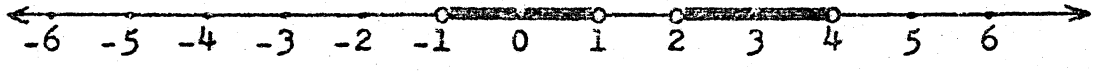
January 12, 1977 WOCOMAL FRESHMAN MEET ANSWERS

ROUND I

1.(1 point) 

2.(1 point) 

3.(1 point) 

4.(3 points) 

ROUND II

1.(1 point) $\frac{9}{4}$ or $2\frac{1}{4}$ or 2.25

2.(1 point) 4320 cu.cm.

3.(2 points) 64 cu.cm.

4.(2 points) 3800 sq.m.

ROUND III

1.(1 point) 27°

2.(1 point) 25%

3.(2 points) 76

4.(2 points) $\frac{168}{5}$ or $33\frac{3}{5}$ or 33.6

ROUND IV

1.(1 point) 540 k.p.h.

2.(2 points) $\frac{5}{9}$

3.(3 points) $\frac{268}{187}$ or $1\frac{81}{187}$

TEAM ROUND

3 POINTS FOR EACH QUESTION

1. $45xy - 24x - 10$
2. $6x^3 - 9x^2 + 30x$
3. $20x$
4. $2x + 3y$
5. $3x^2 - 4x + 3$
6. 0
7. $16x + 4y$
8. 2