

ROUND I: Algebraic word problems

ALL ANSWERS MUST BE IN SIMPLEST EXACT FORM

1. In one basketball game Maria scored three times as many points as Holly. In the next game, Maria scored 7 fewer points than she did in the first game, while Holly scored 9 more points than she did in the first game. If they scored the same number of points in the second game, how many points did each each score in the first game?

2. Max has 80 marbles. Half of them are red. The store sells packs of 12 marbles, each pack containing 4 red, 4 blue, and 4 green marbles. How many packs must Max buy if he wants $\frac{2}{5}$ of his marbles to be red and does not want to throw out any marbles?

3. Carly has a 5 gallon bucket filled with a liquid that is only 40% water. She wants to increase the percentage of water to 75% by removing some of the original liquid solution and replacing it by pure water. How much of the original solution must be removed to get 5 gallons of solution that is 75% water? (Exact answer needed)

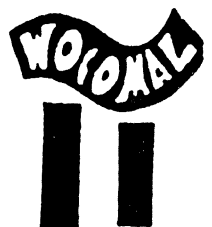
ANSWERS

(1 pt) 1. Maria _____, Holly _____

(2 pts) 2. _____

(3 pts) 3. _____ gal.

Assabet Valley, Doherty, Notre Dame



ROUND III: Ratio, proportion, and variation

ALL ANSWERS MUST BE IN THE FORM SPECIFIED IN THE PROBLEM

1. Some model railroad cars are built in a scale that is $\frac{1}{87}$ th of the actual length. Suppose an actual tank car is 35 feet long. How many inches long will its model be? Round your answer to the nearest tenth of an inch.

2. Find the ratio of x to y if $\frac{8}{2x-3y} = \frac{7}{6x-4y}$.

3. On a map where $\frac{3}{8}$ inch represents 20 miles, Greg measures his "map distance" to be $15\frac{3}{4}$ inches. If his car gets 30 miles per gallon and gas costs \$1.04 per gallon, how much should it cost for his round trip fuel? Get the nearest cent.

ANSWERS

(1 pt) 1. _____ inches

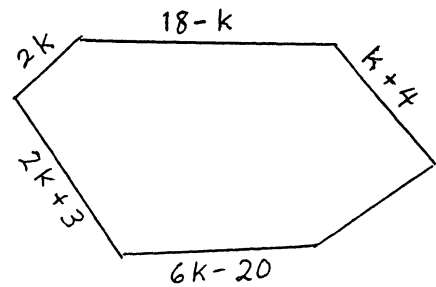
(2 pts) 2. $\frac{x}{y} =$ _____

(3 pts) 3. _____ \$

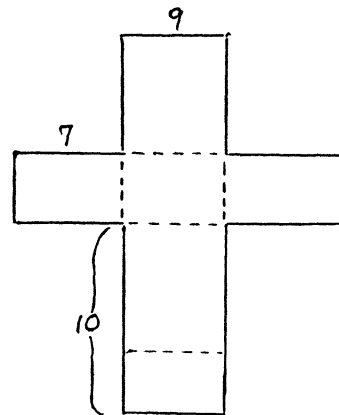
ROUND IV: Perimeter, area, volume

ALL ANSWERS MUST BE IN SIMPLEST EXACT FORM

1. If the perimeter of this hexagon is $13k + 4$, express the length of the unlabeled side in terms of k .



2. A box is to be formed by folding this shape along the dotted lines. Find the volume of the box.



3. A rectangular room has dimensions 39 feet by 27 feet. Plain square tiles that form the periphery measure 18 inches by 18 inches. The remaining floor tiles are speckled and are squares measuring 9 inches on each side. How many plain tiles and how many speckled tiles are needed to cover the floor?

ANSWERS

(1 pt) 1. _____

(2 pts) 2. _____

(3 pts) 3. plain: _____ , speckled: _____

March 3, 1999

WOCOMAL FRESHMAN MEET

TEAM ROUND: Topics of previous rounds and open 3 points each

EXCEPT FOR NUMBER 3, ALL ANSWERS MUST BE IN SIMPLEST EXACT FORM

1. On a car trip, Don averaged 65 mph for 3 hours, then hit traffic and averaged 40 mph for the next hour. What must his average speed be for the next two hours in order to average 60 mph for the 6 hours?
2. What must be added to the sum of $x^2 + 3x + 2$ and $(x + 5)(x - 3)$ in order to arrive at $(2x + 1)^2$?
3. How long, in seconds, does it take for a 95 mph fastball to travel the 60 ft 6 in from the pitcher's mound to home plate? Round your answer to the nearest .001 second. (1 mile = 5280 feet)
4. A 4" by 6" by 8" block of cheese has green mold on all of its six faces. If the cheese is cut into 192 one inch cubes, how many will have no green mold on them?
5. All three of the operations add, subtract, multiply are used to fill in the blanks below at random. Find, as a reduced fraction, the probability that the value of the expression is non-negative.
$$2 \text{ ___ } 5 \text{ ___ } 2 \text{ ___ } 8$$
6. Two cogged wheels are interlocked. The larger wheel has 45 cogs and the smaller has 30 cogs. If the larger wheel is turned at the rate of 50 revolutions per minute, how fast does the smaller wheel turn?
7. If a is 50% larger than c and b is 25% larger than c, then a is what % larger than b?
8. If a car travels X kilometers in H hours, in how many hours can it travel the next Y kilometers at this rate?

Algonquin, Assabet Valley, Bancroft, Hudson, Westborough, Worcester Academy

March 3, 1990

WOTOMAL FRESHMAN, 531 AND 6RS

ROUND I 1 pt 1. M 24 , H 8

al-
word 2 pts 2. 10
prob

3 pts 3. $2\frac{11}{12}$ or $2.91\bar{6}$ or $\frac{35}{12}$

ROUND II 1 pt 1. $12x^3b^5$

incl
ans 2 pts 2. 3

3 pts 3. 4

ROUND III 1 pt 1. 4.8

ratio
ener
var 2 pts 2. $\frac{11}{34}$

3 pts 3. \$58.24

ROUND IV 1 pt 1. $3k-1$

nonin
area 2 pts 2. 189
vol

3 pts 3. p 84 , s 1536
need both

TEAM ROUND 3 pts each

1. 62.5 mph

2. $2x^2 - x + 14$

3. .434 sec may omit

4. 48

5. $\frac{5}{6}$

6. 75 rev/min

7. 20%

8. $\frac{HY}{X}$

