

**7th – 8th Grade
Regional Math Meet Tests
2015**

- Individual Problems
 - Event #1: Problem Solving (No Calculators)
 - Event #2: Problem Solving (With Calculators)
 - Event #3: Mathematical Reasoning
 - Event #4: Mental Math

- Event #5: Team Problems

- Tie Breaker Question

Name: _____

School Team: _____

Event 1: Calculations without a Calculator

Part 1: Computations (2 pts. each)

**Circle your final
answer!**

1) $(4)(5)(12) - 18 + 12 = 4000 - x$

2) $\frac{2}{5} + \frac{1}{10} + \frac{3}{4} + \frac{1}{x} = 1$

3) $\frac{3x}{4} = \frac{2}{7}$

4) $0.24 \div x = 3$

5) $\frac{x}{2} - \frac{5x}{6} = \frac{1}{9}$

Name: _____

School Team: _____

Event 1: Calculations without a Calculator

Part 2: Order of Operations and Evaluating Expressions (2 pts. each)

**Circle your final
answer!**

Simplify the following.

1) $7(9) - 8 + 11 - 6(5 - 2(-3))$

2) $\frac{6 - (3^3 + 6)}{5 - 4^0} \cdot 2$

3) $19 + (10 + (10 - 3)^2) + 2$

4) $m - n \div 4$ if $m = 5$, $n = -8$

5) $-y(x - (9 - 4y)) + 5$ if $x = 4$, $y = -2$

Name: _____

School Team: _____

Event 2: Problem Solving with a Calculator

Part 1: Consumer Word Problems (5 pts. each)

**Circle your final
answer!**

Include labels when needed!

- 1)** Erin's boss promised her a 45% increase. If Erin is currently making \$683 per month, what is her new monthly payment if 14% of her paycheck is taken for taxes and other payments?

- 2)** Jimmy went shopping for jeans and saw that there was a great sale! Jeans that normally cost \$53 were only \$18. What was the percent mark-down for the jeans? Round your answer to the nearest whole percent.

- 3)** Your teachers says that his wife has put an 18×51 foot garden in their backyard. He says that this has reduced the backyard lawn area by 24%. What is the total area of his backyard, including the new garden?

- 4)** Ronald served 18 customers while working 4 hours. Assuming the relationship is directly proportional, how many hours did Ronald work if he served 32 customers? Round to the nearest quarter of an hour.

- 5)** Regina at the store to buy soda. Which is the best deal? 8 cans for \$4.88, 10 cans for \$5.80, 3 cans for \$1.68 or 12 cans for \$7.20?

Name: _____

School Team: _____

Event 3: Mathematical Reasoning with a Calculator

Part 1: Logic and Problem Solving (4 pts. each)

**Circle your final
answer!**

1) Which number(s) is (are) equal to its (their) square?

2) Which number(s) is(are) equal to half its (their) square?

3) The numbers 4 , 12 , 17 and x have an average equal to 14. What is x?

4) Your brother Jack is 2 years from being twice as old as your sister Jenny. The sum of Jack's age and three times Jenny's age is 68. How old is Jenny?

5) Of the people in Paul's apartment building, 7 have been to Africa, 6 have been to Asia, and 3 people have been to both Africa and Asia. How many people have been to Africa but not Asia? How many people have been to at least Asia or Africa?

Name: _____

School Team: _____

Event 3: Mathematical Reasoning with a Calculator

Part 2: Conversions (3 pts. each)

**Circle your final
answer!**

1 foot = 12 inches

1 hour = 60 minutes

1 quart = 2 pints

1 yard = 3 feet

1 tablespoon = 3 teaspoons

1 gallon = 4 quarts

1 mile = 5,280 feet

1 cup = 16 tablespoons

1 pound = 16 ounces

1 minute = 60 seconds

1 pint = 2 cups

1 ton = 2000 pounds

Find the following conversions. Round to the nearest hundredth when necessary.

1) Which is more, 324 teaspoons or 7 cups?

2) How many more cups of milk would you be drinking if you drank 3 gallons of milk rather than 43 cups of milk?

3) Which weighs more, 9 tons or 300,000 ounces?

4) If a pipe leaks 3 pints of water in 12 hours, how many gallons would it leak in a week?

5) If Tara ran 7 feet per second, how many miles per hour is she running?

Name: _____

School Team: _____

Event 4: Mental Math

Example: _____

1. _____

2. _____

3. _____

4. _____

5. _____

6. _____

7. _____

8. _____

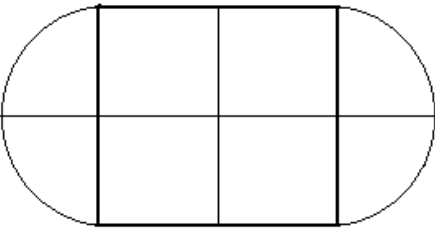
9. _____

10. _____

Event 5: Team Problems (with calculators)*Problem 1: Area and Perimeter (5 pts each)***Use 3.14 for π . Round all answers to the nearest hundredth. Include labels!**

1) A water sprinkler can spray water at a maximum distance of 12 m in all directions. What area of the garden can this sprinkler irrigate?

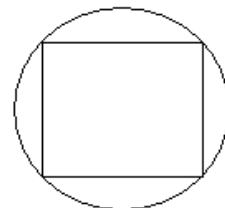
2) Mrs. Rodger's garden is made up of 4 squares and 2 semicircles as shown below. Each small square has an area of 4 square meters. What is the total area of the garden? The perimeter?



3) A rectangle field has an area of 300 square meters and a perimeter of 80 meters. What are the length and width of the field?

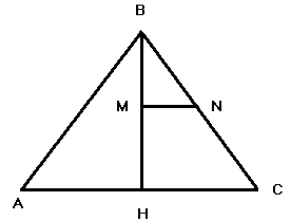
4) Find the circumference of a circle whose area is 100π square centimeters.

5) In the figure below the square has all its vertices on the circle. The area of the square is equal to 400 square cm. What is the area and perimeter of the outer circle?



Event 5: Team Problems (with calculators)*Problem 2: Geometry***Use the figure at right to answer questions 1 and 2. (11 points total)**

ABC is an equilateral triangle with side length equal to 50 cm. BH is a perpendicular bisector of AC.



1) What is the length of BH? If necessary, leave your answer as a *simplified* square root. (6 pts)

2) What is the area of triangle ABC? Do NOT approximate your answer. Leave it in simplified fraction form. (5 pts)

3) Find the missing angles: (1 pt each)

a: _____

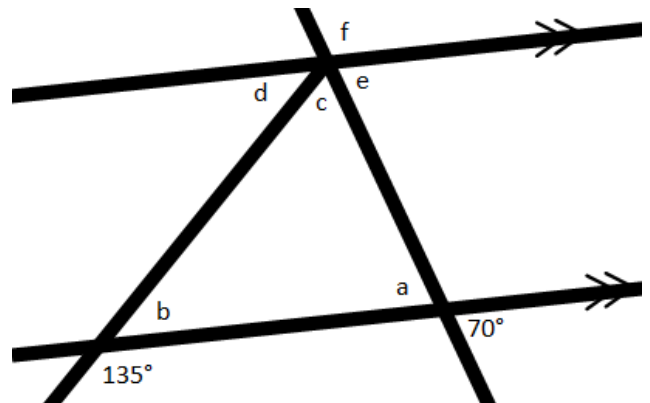
b: _____

c: _____

d: _____

e: _____

f: _____



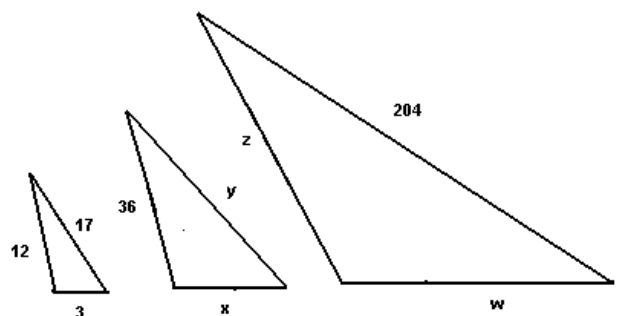
4) Find the unknown sides x, y, z and w if all 3 triangles are similar. (8 points; 2 pts each)

x =

y =

z =

w =



Team: _____

Event 5: Team Problems (with calculators)*Problem 3: Geometry Application Problems including Surface Area and Volume (25 pts total; 5 pts each)*

Excavation for a rectangular pool is being done in your backyard. The pool will be 42 feet long, 29 feet wide, and 8 feet into the ground. Round all answers to the nearest hundredth and include labels.

1) If dirt will be taken away in a truck that can hold 120 ft^3 of dirt at a time, how many loads will it take to clear the dirt from the hole for the pool? Assume that the concrete will take up an additional 2 feet for each dimension.

2) Once the pool construction is finished, you will need to paint the concrete inside. Paint typically comes according to square yards. How many ***square yards*** will you need to cover? Round to the nearest hundredth.

3) If each can of paint costs \$15 including tax and covers 36 square yards, how much money should you expect to spend on paint?

4) You have a coupon for 25% off or \$15 off every \$50 spent. Which is a better deal?

5) A neighbor sees your project and comes to brag about her circular pool. If her pool is 35 feet in diameter and 8 feet deep, does her pool hold more water than yours? What is the difference? Use 3.14 for pi.

Event 5: Team Problems (with calculators)*Problem 4: 25 pts*

Mary is building a colorful picket fence. She needs 300 pickets and only wants to use the colors red, blue, yellow, and green. She is trying to figure out how many of each color she has so she can create a pattern. There is one more red picket than twice the yellow pickets. For yellow pickets, Mary has 2 more than $\frac{1}{3}$ of the amount of green pickets. Finally, she sees that the number of blue pickets is 1 less than 2.5 times the number of yellow tiles.

1. Write distinct equations for each of the following relationships. Use r – red, g – green, y – yellow, b – blue.
(3 points per equation)

a. Relate the number of red pickets to yellow pickets:

b. Relate the number of yellow pickets to green pickets:

c. Relate the number of yellow pickets to blue pickets:

d. Relate the total number of pickets to each color in one equation:

2. Substitute all equations into the equation from d . Make sure you are left with only one variable to solve. Write this equation below. (5 points)

3. How many of each color does Mary have? (8 points)

Name: _____

School Team: _____

Tie Breaker

Circle your final
answer!

Rationalize each the denominator. That is, ensure that no irrational numbers are left in the bottom of the fraction.

1. $\frac{1}{\sqrt{2}} =$

2. $\frac{2}{3+\sqrt{5}} =$

3. $\frac{3}{\sqrt{3}-\sqrt{2}} =$