

7th -8th Grade
Regional Math Meet Tests
2018

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

- **Team Problems**
 - Event 5: Team Problems

- **Tie Breaker Question**

Name: _____ School Team: _____

Event 1: Computations Without Calculator- 20 points total

Circle your final
answer!

Part I (2 points each)

Give all answers in simplest form.

1. Find $\frac{1}{3}$ of 410% of 18

2. We know that $3x + 1 = 2x$. Now find the value of $-5x^2 - 2x$

3. $\frac{1}{8} + \frac{3}{4} \left[\frac{1}{8} + \frac{1}{2} \right] - \frac{1}{4}$

4. $\left(\frac{5}{9} \div \frac{5}{6} \right) - \left(\frac{4}{5} \times \frac{3}{4} \right)$

5. Solve for x: $4(x - 5) + 2 = 3(x - 1)$

Name: _____

School Team: _____

Circle your final
answer!

Event 1: Computations Without Calculator

Part II (2 points each)

Give all answers in simplest form.

1. Write $\frac{3}{1500}$ as a percent.

2. What percent of 18 is 99?

3. Write 0.01% as a decimal.

4. $6^2 + 24 - 4 \times 3 + 2^2 \div 2$

5. $\frac{(5-3)^2}{(3-5)^2} + \frac{(-7+4)^2}{(-3-6)^2}$

Name: _____

School Team: _____

Circle your final
answer!

Event 2: Computations With Calculator- 25 points total

Consumer Math (5 points each)

1. A 100-square-foot box of plastic wrap costs \$1.29 while a 200-square-foot box costs \$2.19. If each box has an extra 100 square feet added free, which is the better buy?
2. A store purchases 25 brooms for \$13.42 each. It then marks up this price by 60% in order to make a profit. After selling 21 of the brooms, the store offers a 25% discount on those remaining. Find the total profit the store can expect. Round to the nearest cent.
3. Ian sold two boats at \$2400 each. He made a profit of 20% on one boat but a loss of 20% on the other boat. Find the net profit or loss. Be sure to label if it is a profit or loss.
4. Suppose that you want to purchase a bike for \$894. After a 7.5% local sales tax is added the cashier enters a 18% off discount code. Find the final price of the bike. Round to the nearest cent.
5. A jacket normally costs \$135. It's on sale for \$60.75. Find the percent decrease of the sale price from the regular price.

Name: _____ School Team: _____

Event 3: Mathematical Reasoning With Calculator- 35 points total

Circle your final
answer!

Geometry (7 points each)

Remember to use labels when appropriate

1. A 10 by 10 square of cubes is built (only 1 block high), glued together, and suspended in the air. The entire group of blocks is then painted. What percent of the blocks will have three faces painted?
2. How many degrees are in the acute angle formed by the hands of an analog clock at 2:20PM?
3. A rhombus has diagonals of lengths 12in and 16in. What is the perimeter of the rhombus?

Name: _____ School Team: _____

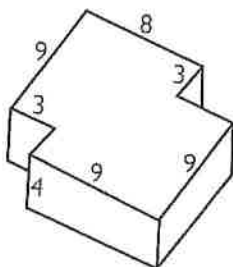
Event 3: Mathematical Reasoning With Calculator- 35 points total

Circle your final answer!

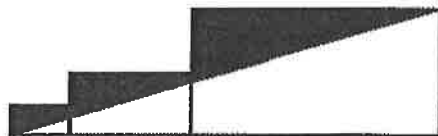
Geometry Part II (7 points each)

Remember to use labels when appropriate

4. Find the volume of the figure below. All angles that appear to be right angles are right angles. All measurements are in centimeters.



5. Three rectangles are lined up as you see below. The first rectangle has a width of 1 in and a length of 2 in. The second rectangle has a width of 2 in and a length of 4 in. The third rectangle has a width of 4 in and a length of 8 in. Find the area of the shaded region.



Name: _____ School Team: _____

Event 4: Mental Math (no calculator)- 20 points total
(2 points each)

Example: _____

1) _____

2) _____

3) _____

4) _____

5) _____

6) _____

7) _____

8) _____

9) _____

10) _____

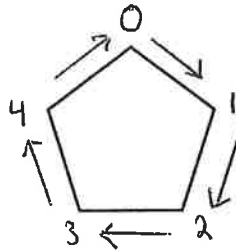
Name: _____

School Team: _____

Circle your final
answer!

Event 5: Team Problems (with calculator)- 100 points total**Part 1: Number Theory (5 points each)**

1. Some aliens have entered your classroom. They work math problems differently than what you're used to. They refuse to use any number above 4. They show you a simple pentagon that they use to solve problems, seen below. For example, to find $3 + 4$ they would start at the 0, move 3 spaces, then move 4 more spaces ending on 2. Thus $3 + 4 = 2$ to them. To find 2×3 , they start at the 0 then move 3 spaces twice, ending on the 1. Thus $2 \times 3 = 1$.



Solve each of the problems below, finding the correct number for each blank.

- a) $2(3 + \underline{\quad}) = 0$
- b) $(3)(\underline{\quad}) + 4 = 1$
- c) $4(2) + 3(4) = \underline{\quad}$
- d) $(2)(3) + (4)(4) + \underline{\quad} = 0$

Name: _____ School Team: _____

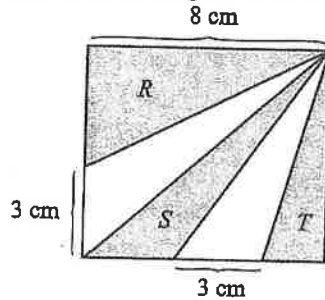
Circle your final answer!

Event 5: Team Problems (with calculator)- 100 points total
Part 2: Geometry and Measurement (5 points each)

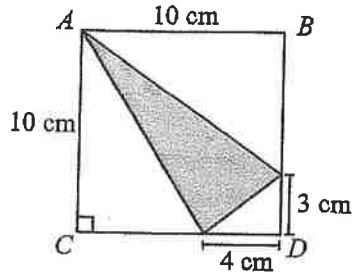
Remember to use clear labels as needed!

2. Solve each of the problems below.

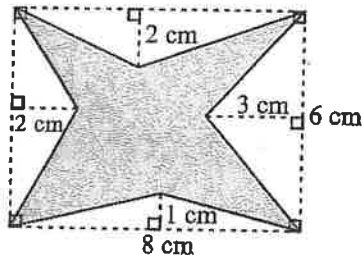
- a) The area of Region R is 16cm^2 . Find the combined area of Regions S and T.



- b) Find the area of the shaded region.



- c) Find the area of the shaded region.



- d) If the length of a rectangle is increased by 20% and the width of the same rectangle is increased by 10%, by what percent will the area of the rectangle increase?

Name: _____ School Team: _____

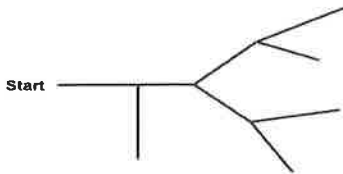
Circle your final answer!

Event 5: Team Problems (with calculator)- 100 points total

Part 3: Probability (6 points each)

Remember to simplify all fractions!

- a) Suppose that a rat is sent into the below maze at the 'start.' If the rat cannot go backwards, but otherwise makes all the decisions at random, what is the probability that she finds a cheese?



- b) Two fair dice are rolled. Find the probability that the sum of the dice is a prime number.
- c) Three fair coins are tossed. If you know that one of the coins shows heads, what is the probability that all three coins show heads?
- d) Suppose I have 4 slips of paper. I write one number on each slip: 1, 8, 9, and 9. I then put all four slips in a bag, mix them up, and pull them out one by one (without replacing them) to create a 4-digit number using the numbers in the order drawn. What is the probability that I will create a prime number by doing this?
- e) You flip a fair coin and then roll a fair die. What is the probability that you get a head and then a multiple of three?

Name: _____ School Team: _____

Circle your final
answer!

Event 5: Team Problems (with calculator)- 100 points total

Part 4: Patterns and Number Theory (6 points each)

- a) A prime number p is called a Sophie Germain prime if $2p+1$ is also prime. What percent of the first ten prime numbers are Sophie Germain prime numbers?
- b) A square of numbers is created as seen below. Find the number that should go where the X is.

1	2	3	4
2	5	10	17
3	10	25	52
4	17	52	X

- c) A mathematician writes the words "MATH MEET" together with no spaces, repeating them infinitely as shown below. What letter will be the 2018th letter in the sequence?

MATHMEETMATHMEETMATHMEETMATHMEETMATHMEET...

- d) Give the next three terms in the sequence below:

1.85, 2.855, 3.91, 4.915, 5.92...

- e) Give the next three terms in the sequence below:

5, 7, 12, 19, 31, 50...

Name: _____ School Team: _____

Circle your final
answer!

TIE BREAKER (with calculator)

- 1) The sum of three different whole numbers is 10. Their product is 20. Find the median of the three numbers.

- 2) The mean of three numbers a , b , and c is 7. The mean of five numbers a , b , c , d , and e is 13. Find the mean of d and e .

- 3) Ann needs a mean of 80 on her five exams in order to earn a B in her class. Her exam scores so far are 78, 90, 64 and 83. What does she need to get on her fifth exam to earn the B?