

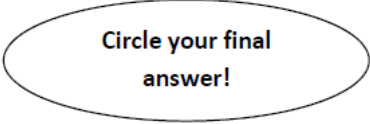
7th -8th Grade
Regional Math Meet Tests
2020

- **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. Write $\frac{3^2 \times 6^{-2}}{10^{-3} \times 5^2}$ as an integer

2. What percent of 1.6 is 17.2?

3. $\left[\sqrt[3]{27} - \left(\frac{1}{2}\right)^2 \right] \times \frac{2}{3}$

4. $-5^2 - 25 \div 5 \times 2 - 7$

5. $\frac{1 - \frac{2}{3}(6+15)}{|542 - 2(349)|}$

Name: _____

School Team: _____

Circle your final
answer!

Event 1: Computations Without Calculator

Part II (2 points each)

Give all answers in simplest form.

1. $0.135 \times 240 \div \frac{1}{8}$

2. Find the reciprocal of $1.73 \times 2\frac{4}{5}$

3. Find 245% of $\frac{5}{6}$ of 96

4. $4\frac{3}{4} \times 6 + 103 - 72.5$

5. $(\frac{5}{6} - \frac{1}{3}) \div 1\frac{1}{3} + \frac{1}{2}$

Name: _____ School Team: _____

Circle your final
answer!

Event 2: Computations With Calculator- 25 points total

Consumer Math (5 points each)

1. April bought five copies of a favorite book, one for herself and four as gifts. The books were on sale for 10% off their normal price. After paying 3.8% tax and 50 cents to gift wrap each book that is a gift, April had spent a total of \$95.19. Find the usual cost of each book. Always round to the nearest cent.
2. A local vendor sells 3 cucumbers for \$1, 2 cucumbers for 75 cents, and 1 cucumber for 40 cents. A restaurant purchased 35 cucumbers. Find the lowest price they might expect to pay for the cucumbers.
3. A real estate agent earns a 7% commission on all home sales. Find the price of the house if a commission was \$5,775.00.
4. 150 shares of a certain stock are purchased for \$12.89 a share. The broker negotiating the purchase charged a 2% commission on the sale. A week later, stock prices rose to \$14.82. If you sell all the shares at that price and again must pay a 2% commission on the sale, find the net profit.
5. June bought a dress to wear to a wedding. The usual price was discounted by 25%. Additionally, June used a coupon to receive 10% off the sale price. The 8.3% sales tax came to \$6.69. Find the usual price of the dress. Be sure to round to the nearest cent with every calculation.

Name: _____ School Team: _____

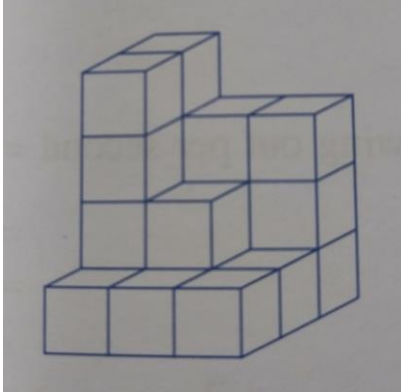
Event 3: Mathematical Reasoning With Calculator- 35 points total

Circle your final
answer!

Geometry Part II (7 points each)

Remember to use labels when appropriate

4. Shameka has 20 cubes arranged as shown. Each cube has a volume of 1cm^3 . Find the surface area of the 3D figure she made.



5. A solid cube whose edge is 4cm long weighs 192g. How heavy will a similar cube be if its edge measures 9cm?

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: Factorials (4 points each)

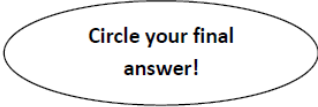
In mathematics, the notation $n!$ is read “n factorial”. To find $n!$, we find the value of

$$1 \times 2 \times 3 \times \dots (n - 1) \times n$$

For example, $4! = 1 \times 2 \times 3 \times 4$

1. Find x if $6! \times 7! = x!$
2. Find n if $(5!)(n) = (-2)(-4)(-6)(-8)(-10)$
3. Find the value of $\frac{1000! - 999!}{999!}$
4. Find the GCF of $8!$ and 4^3 .
5. If we wrote out $50!$ As a whole number, how many zeros would be on the end of the number?

Name: _____ School Team: _____

Circle your final
answer!**Event 5: Team Problems (with calculator)- 100 points total**

Part 2: Statistics (7 points each)

Remember to label as appropriate!

1. The mean April rainfall of a certain city was 3.39 inches over a 20 year period. Suppose this month it's unusually rainy. How much rainfall is required to increase the mean by a minimum of 0.11in?
2. Using the frequency table provided, find the mean, median, and mode. Be sure to clearly label each. Round to the nearest cent.

Income	Frequency
\$1,250,000	1
\$345,000	3
\$130,000	6
\$85,000	8
\$55,000	12

3. The mean of a set of 50 numbers is 38. The numbers 45 and 55 are discarded from the set. Find the mean of the set of remaining numbers.
4. Annabeth wants to earn a 90% overall average in her math class. Her current scores are 83%, 92%, 78%, 96%, and 89%. What grade does she need to average on the next three assessments in order to meet her goal?

Name: _____ School Team: _____

Circle your final
answer!

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

Part 3: Algebra (4 points each)

Remember to simplify all fractions!

1. Find the sum of the reciprocals of two numbers, given that these numbers have a sum of 50 and a product of 25.
2. If $(mx + 7)(5x + n) = px^2 + 15x + 14$, find $m(n + p)$
3. Find w in terms of x if $(x - 3)(x + 4) = (x + 3)(x - 4) + w$
4. Find the value of $x - y$ if $x^2 - y^2 = 10$ and $x + y = 10$
5. Give the LCM of x^3 , x^4 , and x^5 .

Name: _____ School Team: _____

Circle your final
answer!

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

Part 4: Probability (8 points each)

Write all answers as a simplified fraction

1. The Fibonacci Sequence begins with the numbers 1, 1, 2, 3, 5, 8,... To create the next value in the sequence, you find the sum of the previous two values. A fair die is labeled with the first six numerals of this sequence- one on each face.
 - a) If the die is rolled twice and the sum of the numbers is found, what is the probability that the sum is in the sequence?
 - b) If the die is rolled twice and the sum of the numbers is found, what is the probability that the sum is even?
 - c) If the die is rolled twice and the product of the numbers is found, what is the probability that the product is in the sequence?
 - d) If the die is rolled twice and the product of the numbers is found, what is the probability that the product is at least 6?

Name: _____ School Team: _____

Circle your final
answer!

TIE BREAKER (with calculator)

- 1) A number is randomly selected from the numbers 1 through 60. Given that the number is prime, what is the probability that one of its digits is 9? Write your answer as a fraction in simplest terms.

- 2) P is the product of all prime numbers between 50 and 70. How many positive integers are factors of P?

- 3) How many primes have the property that when 3 is added to the cube of the prime, the result is another prime number?