Name:_____ School Team: _____

Circle your final answer!

Event 1: Computations Without Calculator- 20 points total

Part I (2 points each)

Remember to simplify all fractions if able!

1. $\frac{15}{63} \div \frac{25}{49}$

2. $16 - 22 + 18 \times 3$

3. 18% of 312

4. Write 352% as a simplified mixed number

5. If $x = 2$ and $y = 5$, find $3x - 2y + 6xy$

Name:_____ School Team: _____

Circle your final answer!

Event 1: Computations Without Calculator- 20 points total

Part II (2 points each)

Remember to simplify all fractions if able!

1. $16.41 \div 0.3$

2. Find what x is if $\frac{3}{5x} = \frac{24}{40}$

3. $2\frac{5}{6} \times 4$

4. $4 \times (3 - \frac{5}{4}) - (2 + \frac{3}{4})$

5. Find the Greatest Common Factor of 90 and 48.

Name:_____ School Team: _____

Circle your final answer!

Event 2: Computations With Calculator- 25 points total

Consumer Math (5 points each)

1. A woman wants to go on vacation to Thailand. She knows that she can exchange $5.49 for 147 Thai Bahts (money used in Thailand). If she receives 9,342 Thai Bahts, how many US dollars did she exchange? Round your answer to the nearest cent.

2. A man bought a piano for $4519.52. He wants to sell the piano and make a 45% profit. How much should he sell the piano for? Round your answer to the nearest cent.

3. Store A and Store B both sell condensed milk. Store A offers 18.3 ounces of condensed milk for $3.19. Store B offers 16.4 ounces of condensed milk for $2.97. Which is the better buy?

4. A man earns $48,617.52 in a year. He first pays 8% tax on his salary. He then saves 10% of the remaining money. How much money does he save in 3 years? Round all amounts to the nearest cent.

5. A woman bought 150 magazines for $450. She sold half of them at a profit of 20%, 50 of them at a profit of 10%, and the rest at a profit of 5%. How much money did she make?

Name:_____ School Team: _____

Event 3: Mathematical Reasoning With Calculator- 35 points total

Circle your final answer!

Part I: Logic and Patterns (7 points each)

Remember to use labels when appropriate

1. Find the number which fits the following clues:
   - All digits are odd, and every possible odd digit is used exactly one time
   - The digits are not in increasing or decreasing order
   - The first digit is not a multiple of 3
   - No digit is next to the next higher or lower odd digit
   - The middle digit is 5
   - The number is greater than 20,000

2. Three friends are from different schools (Greenville, Bloomsberry, or Windschill) and enjoy different sports (swimming, basketball, or volleyball). Determine which friend attends which school and enjoys which sport using the clues below. Fill out the chart below with your answers.
   - Melissa does not attend Greenville.
   - Amy does not attend Bloomsberry.
   - The student who likes volleyball does not attend Windschill.
   - The student who likes swimming is not from Greenville.
   - Melissa likes volleyball.
   - Tony does not like to swim.

Name	School	Sport
Tony		
Melissa		
Amy		

Name:_____ School Team: _____

Event 3: Mathematical Reasoning With Calculator- 35 points total

Circle your final answer!

Part II: Logic and Patterns (7 points each)

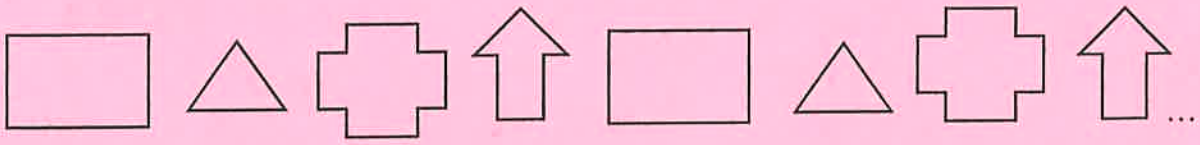
3. Find the next two numbers in the number sequence.

   1, 8, 27, 64, _____, _____

4. Find the next two numbers in the number sequence.

   1, 3, 6, 10, _____, _____

5. Find the 67th shape in the following sequence.



The 67th shape will be _____

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: Statistics (6 points each)

Do not round any decimal answers!

1. A Science teacher writes the scores for a chapter test down below. Each score is out of 100 possible points.
   78, 92, 65, 100, 94, 73, 82, 91, 60, 91, 93, 98, 100, 84, 91, 78

   a) What is the mode of all the test scores?

   b) What is the median of all the test scores?

   c) What is the mean of all the test scores?

   d) If 3 more students take the test and each scores above 86 points, what will happen to the mean? (Go up, go down, or stay the same?)

   e) Two more students take the test and score 89 and 90. Find the new median.

Name:_____ School Team: _____

Circle your final answer!

Event 5: Team Problems (with calculator)

Part 2: Probability (6 points each)

Remember to simplify all fractions if able!

2. A teacher offers her students a deal: Each day they can pick a letter at random from a bag which holds all the letters of the alphabet. Their goal is to spell the word "FIESTA", at which time they will get a party.

   a) What is the probability of randomly selecting a letter from the word "FIESTA" on the first day?

   b) During the first four days of school, students chose the letters D, Q, C, and W. These letters were kept out of the bag. What is the probability that the next letter selected from the bag will be a letter from the word "FIESTA"?

   c) A student reaches in the bag and selects a letter. He tells the class that his letter is in the word "FEBRUARY". What is the probability that the letter is also in the word "FIESTA"?

   d) For 8 days, a letter has been drawn from the bag and not replaced. None of the letters were a part of the word "FIESTA". Find the probability that a letter from the word "FIESTA" is drawn on the 9th day.

   e) After the letter drawn on the 9th day (see part (d)) was also not a part of the word "FIESTA", the students complained that it was taking too long. So the teacher promised to add copies of the letters A, I, and E to the bag. What is the probability that a letter from the word "FIESTA" will be drawn on the 10th day?

Name:_____ School Team: _____

Circle your final answer!

Event 5: Team Problems (with calculator)

Part 3: Ratios (5 points each)

Remember to simplify all ratios if able!

3. In a pet shop, the ratio of bunnies to puppies is 3:5. All bunnies are white or black. The ratio of white bunnies to black bunnies is 2:1. All puppies are black or brown. The ratio of black puppies to brown puppies is 2:1.

   a) If there are 30 puppies, how many puppies are brown?

   b) If there are 12 white bunnies, what is the total number of bunnies in the shop?

   c) The pet shop also has 24 kittens. Find the ratio of the number of bunnies to the number of puppies to the number of kittens. *Hint: Use the information from parts (a) and (b).*

   d) Later that week, four bunnies, six puppies, and 8 kittens have been sold. The pet store also received six bunnies, ten puppies, and two kittens to sell. Find the new ratio of the number of bunnies to the number of puppies to the number of kittens. *Hint: Use the information from parts (a), (b), and (c).*

Name:_____ School Team: _____

Circle your final answer!

Event 5: Team Problems (with calculator)

Part 4: Problem Solving (5 points each)

4.

a) There were some marbles in a bag. Anita took half of the marbles out of the bag. She then put one marble back in the bag. She completed this process 3 times. There were 7 marbles left in the bag at the end. How many marbles were there in the bag at first?

b) Penelope has some beads. She splits them into 4 equal groups, but 1 bead is left out. When she splits them into 5 equal groups, 1 bead is still left out. When she splits them into 6 equal groups, 1 bead is still left out. What is the smallest number of beads that Penelope might have if we know that she has more than 1 bead?

c) Andre had some books. He donated 20% of his books to the school library. Andre then gave a third of his remaining books to his cousin. 25% of Andre's remaining books had more than 10 chapters. If Andre had 24 books with less than 10 chapters, how many books did he have at first?

d) A recipe for ice cream requires $3\frac{1}{4}$ cups of chocolate chips and serves 8 people. You want to change the recipe in order to serve 10 people? How many cups of chocolate chips will the recipe require? Be sure to write your answer as a simplified mixed number.

Name:_____ School Team: _____

Circle your final answer!

Event 1: Computations Without Calculator- 20 points total

Part I (2 points each)

Remember to simplify all fractions if able!

1. $\frac{15}{63} \div \frac{25}{49} = \frac{\cancel{15}^{3}}{\cancel{63}_{9}} \cdot \frac{\cancel{49}^{7}}{\cancel{25}_{5}} = \frac{7}{15}$

2. $16 - 22 + 18 \times 3 = 16 - 22 + 54 = -6 + 54 = 48$

3. 18% of 312

$10\% \rightarrow 31.2$

$1\% \rightarrow 3.12$ (×8)

$8\% \rightarrow 24.96$

$$\begin{array}{r} 31.2 \\ +\ 24.96 \\ \hline 56.16 \end{array}$$

56.16 or $56\frac{4}{25}$

4. Write 352% as a simplified mixed number

$352\% = \frac{352}{100} = 3\frac{52}{100} = 3\frac{26}{50} = 3\frac{13}{25}$

5. If x = 2 and y = 5, find 3x – 2y + 6xy

$3(2) - 2(5) + 6(2)(5) = 6 - 10 + 60$

$= -4 + 60$

$= 56$

Name:_____ School Team: _____

Circle your final answer!

Event 1: Computations Without Calculator- 20 points total

Part II (2 points each)

Remember to simplify all fractions if able!

1. $16.41 \div 0.3$

$$0.3\overline{)16.41} \quad 54.7$$

-15

14

-12

21

54.7 or $54\frac{7}{10}$

2. Find what x is if $\frac{3}{5x} = \frac{24}{40}$

$\frac{3}{5x} \cdot \frac{8}{8} = \frac{24}{40}$ So $5x \cdot 8 = 40$

$5x = 5$

$x = 1$

3. $2\frac{5}{6} \times 4 = \frac{17}{6} \times \frac{4}{1} = \frac{34}{3}$ or $11\frac{1}{3}$ or $11.\overline{3}$

4. $4 \times (3 - \frac{5}{4}) - (2 + \frac{3}{4}) = 4 \times 1\frac{3}{4} - 2\frac{3}{4} = \frac{4}{1} \cdot \frac{7}{4} - 2\frac{3}{4} = 7 - 2\frac{3}{4}$

$= 4\frac{1}{4}$ or $\frac{17}{4}$

or 4.25

5. Find the Greatest Common Factor of 90 and 48.

90: 9×10; $3 \times 3 \times 5 \times 2$

48: 6×8; $2 \times 3 \times 2 \times 2 \times 2$

6

5th – 6th grades 2017

Name:_____ School Team:_____

Circle your final answer!

Event 2: Computations With Calculator- 25 points total

Consumer Math (5 points each)

1. A woman wants to go on vacation to Thailand. She knows that she can exchange $5.49 for 147 Thai Bahts (money used in Thailand). If she receives 9,342 Thai Bahts, how many US dollars did she exchange? Round your answer to the nearest cent.

$\frac{5.49}{147} = \frac{x}{9,342}$

$9342 \div 147 \approx 63.55$ (groups of 147 Thai Bahts, or groups of $5.49)

$63.55 \times \$5.49 = \$348.8895$

$348.89 or $348.90 (Depends on when you round)

2. A man bought a piano for $4519.52. He wants to sell the piano and make a 45% profit. How much should he sell the piano for? Round your answer to the nearest cent.

145% of $4519.52 is $1.45 \times \$4519.52$

$6,553.30

3. Store A and Store B both sell condensed milk. Store A offers 18.3 ounces of condensed milk for $3.19. Store B offers 16.4 ounces of condensed milk for $2.97. Which is the better buy?

Store A → $3.19 ÷ 18.3 ≈ $0.17 per ounce

Store B → $2.97 ÷ 16.4 ≈ $0.18 per ounce

Store A is a better buy

4. A man earns $48,617.52 in a year. He first pays 8% tax on his salary. He then saves 10% of the remaining money. How much money does he save in 3 years? Round all amounts to the nearest cent.

$0.08 \times \$48,617.52 \approx \$3889.40$ (tax)

$\$48,617.52 - \$3889.40 = \$44,728.12$

$0.1 \times \$44,728.12 \approx \$4472.81$ (saved each year)

$4472.81 saved each yr

x 3 yrs

$13,418.43 .44

5. A woman bought 150 magazines for $450. She sold half of them at a profit of 20%, 50 of them at a profit of 10%, and the rest at a profit of 5%. How much money did she make?

$450 ÷ 150 = $3 per magazine

$3 × 75 = $225

profit of 20% means 1.2 × $225 = $270

$3 × 50 = $150

profit of 10% means 1.1 × $150 = $165

$3 × 25 = $75

profit of 5% means 1.05 × $75 = $78.75

sold for: $270 + $165 + $78.75 =

$513.75

(original cost)

$513.75 − $450 = $63.75

$63.75

5th – 6th grades 2017

Name:_____ School Team: _____

Event 3: Mathematical Reasoning With Calculator- 35 points total

Circle your final answer!

Part I: Logic and Patterns (7 points each)

Remember to use labels when appropriate

1. Find the number which fits the following clues:
   - All digits are odd, and every possible odd digit is used exactly one time → 1 3 5 7 9
   - The digits are not in increasing or decreasing order
   - The first digit is not a multiple of 3 → must be 1, 5, or 7
   - No digit is next to the next higher or lower odd digit
   - The middle digit is 5
   - The number is greater than 20,000

71,593

7	1	5	9	3
~~1~~	1	1	~~1~~	1
~~3~~	~~3~~	3	~~3~~	3
~~5~~	~~5~~	5	5	5
7	~~7~~	7	~~7~~	7
~~9~~	~~9~~	9	9	9

2. Three friends are from different schools (Greenville, Bloomsberry, or Windschill) and enjoy different sports (swimming, basketball, or volleyball). Determine which friend attends which school and enjoys which sport using the clues below. Fill out the chart below with your answers.
   - Melissa does not attend Greenville.
   - Amy does not attend Bloomsberry.
   - The student who likes volleyball does not attend Windschill.
   - The student who likes swimming is not from Greenville.
   - Melissa likes volleyball.
   - Tony does not like to swim.

Name	School	Sport
Tony	G ~~B~~ W Greenville	~~S~~ B ~~V~~ Basketball
Melissa	~~G~~ B ~~W~~ Bloomsberry	S B V Volleyball
Amy	~~G~~ ~~B~~ W Windschill	S B ~~V~~ Swimming

Name:_____ School Team: _____

Event 3: Mathematical Reasoning With Calculator- 35 points total

Circle your final answer!

Part II: Logic and Patterns (7 points each)

3. Find the next two numbers in the number sequence.

1, 8, 27, 64, 125, 216

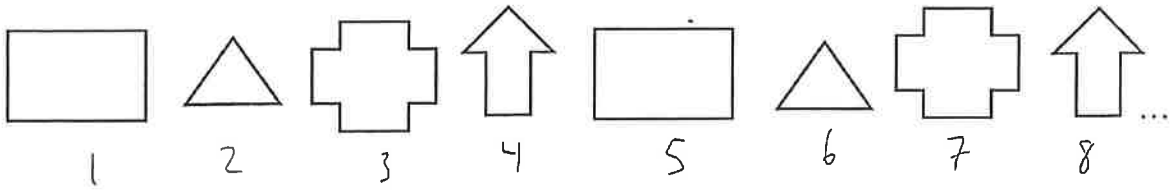
1^3 2^3 3^3 4^3 5^3 6^3

4. Find the next two numbers in the number sequence.

1, 3, 6, 10, 15, 21

2 3 4 5 6

5. Find the 67th shape in the following sequence.



Every 4th shape is ⇧, so shape 68 is ⇧, so before that is ✚

The 67th shape will be ✚

Name:_____ School Team:_____

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

Example: 23

1) 2

2) 2518

3) 63

4) 99

5) 16

6) -85

7) $\frac{1}{2}$

8) 60

9) $x = 4$

10) $15\ cm^2$

Name:_____ School Team: _____

Circle your final answer!

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

Part 1: Statistics (6 points each)

Do not round any decimal answers!

1. A Science teacher writes the scores for a chapter test down below. Each score is out of 100 possible points.

   78, 92, 65, 100, 94, 73, 82, 91, 60, 91, 93, 98, 100, 84, 91, 78

   a) What is the mode of all the test scores?

   ↳ occurs most often

   91

   b) What is the median of all the test scores?

   ↳ middle if arranged in order

   91

   60 65 73 78 78 82 84 91 91 91 92 93 94 98 100 100

   c) What is the mean of all the test scores?

   ↳ add all and divide by the number of scores

   16 total scores

   $1370 \div 16 = 85.625$

   85.625

   d) If 3 more students take the test and each scores above 86 points, what will happen to the mean? (Go up, go down, or stay the same?)

   Go up

   (We could have 16 tests all scoring 85.625. If three more tests are added in and all score higher than the mean, we would get a larger value than 19×85.625)

   e) Two more students take the test and score 89 and 90. Find the new median.

   60 65 73 78 78 82 84 89 90 91 91 91 92 93 94 98 100 100

   90.5

   $\frac{90+91}{2} = \frac{181}{2} = 90.5$

Name:_____ School Team: _____

Circle your final answer!

Event 5: Team Problems (with calculator)

Part 2: Probability (6 points each)

Remember to simplify all fractions if able!

2. A teacher offers her students a deal: Each day they can pick a letter at random from a bag which holds all the letters of the alphabet. Their goal is to spell the word "FIESTA", at which time they will get a party.

   a) What is the probability of randomly selecting a letter from the word "FIESTA" on the first day?

   $\frac{6}{26} = \frac{3}{13}$

   b) During the first four days of school, students chose the letters D, Q, C, and W. These letters were kept out of the bag. What is the probability that the next letter selected from the bag will be a letter from the word "FIESTA"?

   $\frac{6}{22} = \frac{3}{11}$

   c) A student reaches in the bag and selects a letter. He tells the class that his letter is in the word "FEBRUARY". What is the probability that the letter is also in the word "FIESTA"?

   F E B R U A R Y

   F E A I S T

   $\frac{3}{7}$ (Don't count R twice)

   d) For 8 days, a letter has been drawn from the bag and not replaced. None of the letters were a part of the word "FIESTA". Find the probability that a letter from the word "FIESTA" is drawn on the 9th day.

   $\frac{6}{18} = \frac{1}{3}$

   e) After the letter drawn on the 9th day (see part (d)) was also not a part of the word "FIESTA", the students complained that it was taking too long. So the teacher promised to add copies of the letters A, I, and E to the bag. What is the probability that a letter from the word "FIESTA" will be drawn on the 10th day?

   $\frac{9}{17}$ $\frac{9}{20}$

$\frac{26}{-9}$ $\frac{17}{17}$ $\frac{9}{20}$ 17 16 +3 19 $\frac{7}{19}$

Name:_____ School Team: _____

Circle your final answer!

Event 5: Team Problems (with calculator)

Part 3: Ratios (5 points each)

Remember to simplify all ratios if able!

3. In a pet shop, the ratio of bunnies to puppies is 3:5. All bunnies are white or black. The ratio of white bunnies to black bunnies is 2:1. All puppies are black or brown. The ratio of black puppies to brown puppies is 2:1.

a) If there are 30 puppies, how many puppies are brown?

$2+1=3$ $30 \div 3 = 10$

(10)

b) If there are 12 white bunnies, what is the total number of bunnies in the shop?

$12 \div 2 = 6$

$3 \times 6 = 18$

(18)

c) The pet shop also has 24 kittens. Find the ratio of the number of bunnies to the number of puppies to the number of kittens. *Hint: Use the information from parts (a) and (b).*

$18:30:24 =$ (3:5:4)

d) Later that week, four bunnies, six puppies, and 8 kittens have been sold. The pet store also received six bunnies, ten puppies, and two kittens to sell. Find the new ratio of the number of bunnies to the number of puppies to the number of kittens. *Hint: Use the information from parts (a), (b) and (c).*

bunnies	puppies	kittens
18	30	24
−4	−6	−8
+6	+10	+2
20	34	18

$20:34:18 =$ (10:17:9)

Name:_____ School Team: _____

Circle your final answer!

Event 5: Team Problems (with calculator)

Part 4: Problem Solving (5 points each)

4.

a) There were some marbles in a bag. Anita took half of the marbles out of the bag. She then put one marble back in the bag. She completed this process 3 times. There were 7 marbles left in the bag at the end. How many marbles were there in the bag at first?

42

42 ÷ 2 = 21 → 21 + 1 = 22 (1)

22 ÷ 2 = 11 → 11 + 1 = 12 (2)

12 ÷ 2 = 6 → 6 + 1 = 7 (3)

b) Penelope has some beads. She splits them into 4 equal groups, but 1 bead is left out. When she splits them into 5 equal groups, 1 bead is still left out. When she splits them into 6 equal groups, 1 bead is still left out. What is the smallest number of beads that Penelope might have if we know that she has more than 1 bead?

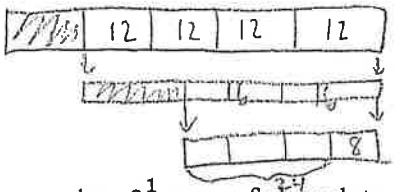
LCM (4, 5, 6) = 60

1 more (1 left out)

61

c) Andre had some books. He donated 20% of his books to the school library. Andre then gave a third of his remaining books to his cousin. 25% of Andre's remaining books had more than 10 chapters. If Andre had 24 books with less than 10 chapters, how many books did he have at first?

60



24 ÷ 3 = 8

4 × 8 = 32

3 × 16 = 48

48 ÷ 4 = 12

5 × 12 = 60

d) A recipe for ice cream requires $3\frac{1}{4}$ cups of chocolate chips and serves 8 people. You want to change the recipe in order to serve 10 people? How many cups of chocolate chips will the recipe require? Be sure to write your answer as a simplified mixed number.

$\frac{1}{8} \times 3\frac{1}{4} = \frac{1}{8} \times \frac{13}{4} = \frac{13}{32}$ (cups per person)

$\frac{5}{10} \times \frac{13}{32} = \frac{65}{16} = 4\frac{1}{16}$

16

5th – 6th grades 2017

Name:_____ School Team: _____

Circle your final answer!

TIE BREAKER

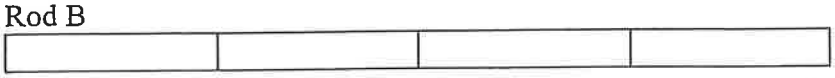
Remember to simplify!

For each problem below, the rod sections are the same length.

1. If the length of Rod B is $^2/_3$ unit, what is the length of Rod A?

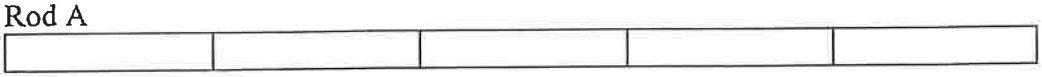
$\frac{2}{3} \div 4 = \frac{2}{3} \times \frac{1}{4} = \frac{1}{6}$

Rod B



$5 \times \frac{1}{6} = \frac{5}{6}$

Rod A

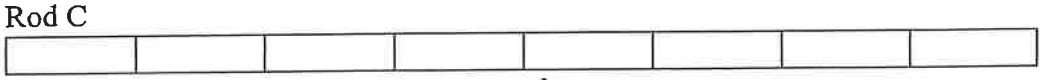


$\frac{5}{6}$ units

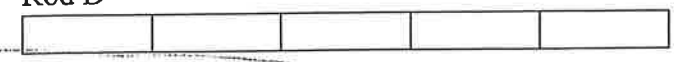
2. If the length of Rod C is $5\frac{1}{2}$ units, what is the length of Rod D?

$\frac{11}{2} \div 8 = \frac{11}{2} \cdot \frac{1}{8} = \frac{11}{16}$

Rod C



Rod D



$5 \times \frac{11}{16} = \frac{55}{16}$

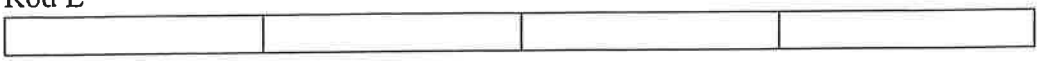
$\frac{55}{16}$ units or $3\frac{7}{16}$ units

3. If the length of Rod E is 5.2 units, what is the length of Rod F?

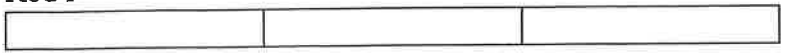
$5.2 \div 4 = 1.3$

$3 \times 1.3 = 3.9$

Rod E



Rod F



3.9 units