Name ________________________________ School Team ________________________

Event 1: Problem Solving (no calculators) 7th/8th grade Math Meet '09

Part 1: Computations (2 pts. each)

1) $2000 - ? = 11 \times 10 \times 8 + 40$

2) 27% of 45 = ? % of 81

3) $1/5 + 1/6 + 1/5 + 1/3 + ? = 1$

4) $0.54 \div ? = 9.0$

5) $\frac{21}{56} = \frac{?}{72}$

Event 1: Problem Solving (no calculators) 7th/8th grade Math Meet '09

Part 2: Defining a new operation (3 pts. each)

Let's define a new operation: A x (B - C) + A x (B + C)

For example: (1, 2, 3) = 1 x (2 - 3) + 1 x (2 + 3) = -1 + 5 = 4

1) (1, 3, 5)

2) (3, 0, 1)

3) (2, 2, 2)

Circle one:

4) Does (A, B, C) = A x B + A x B ? Yes No

5) Does (A, B, C) = (B, A, C) ? Yes No

Name ______________________________________School Team ____________________

Event 2: Problem Solving (with calculators) 7th/8th grade Math Meet '09

Part 1: Length and Area Conversions between the Metric System and the English System. (2 pts each)

Recall English System	and	Metric System
1 foot = 12 inches		1 meter = 1000 mm
1 yard = 3 feet		1 meter = 100 cm
1 mile = 1760 yards		1 km = 1000 meter
1 square foot = 144 square inches		1 square m = 10,000 square cm
1 square yard = 9 square feet		1 square km = 1,000,000 square m

Using the following conversion information, decide which is bigger.

1 in = 2.54 cm
1 ft = 0.3048 m
1 mile = 1.609 km

1 square foot = 0.0929 square meters
1 square mile = 2.59 square kilometers

1) Which has a bigger area, 1 square mile or 1 square kilometer?

2) Which is longer, 14 feet or 4 meters?

3) Which is longer, 6 miles or 6.3 kilometers?

4) Which is longer, 63 cm or 25 inches?

5) Which has a bigger area, 38.75 square feet or 3.5 square meters?

Event 2: Problem Solving (with calculators) 7th/8th grade Math Meet ‘09

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1 in = 2.54 cm
1 ft = 0.3048 m
1 mile = 1.609 km

1 square foot = 0.0929 square meters
1 square mile = 2.59 square kilometers

Circle the bigger amount. (3 pts each)

6) 63 cm 2 feet

7) 6 ½ miles 4000 meters

8) 15840 feet 4.5 km

9) 14 square yards 11 square meters

10) 2 square feet 1860 square centimeters

Name ______________________________________School Team____________________

Event 3: Logic and Reasoning (with calculators) 7th/8th grade Math Meet '09

Part 1: Making new friends. (4 pts. each)

You are starting up at a new school and have already made friends with 4 people from the area. You are a very likeable sort and everyone who meets you immediately becomes a great friend. On the first day of school you will shake hands with every new person that you meet. Here is how your first day may look:

Number of friends:	4	5	6	7	8 . . .
Number of handshakes:	0	1	2	3	4 . . .

Answer the following questions.

1) How many friends will you have if you shake hands with 10 people?

2) How many friends will you have if you shake hands with 20 people?

3) How many handshakes will you make if you have 10 friends?

4) How many handshakes will you make if you have 50 friends?

Event 3: Logic and Reasoning (with calculators)   7th/8th grade Math Meet '09

Part 2: Everyone shakes. (6 pts. each)

You are attending a picnic. Everyone who comes to the picnic will shake hands with each other. There is a pattern to predict how many handshakes will occur, given the amount of people. Here is how it starts:

Number of people:	1	2	3	4	5	6 . . .
Number of handshakes:	0	1	3	6	10	15 . . .

Answer the following questions.

5) If 8 people attend the picnic, how many handshakes will there be?

6) If 10 people attend the picnic, how many handshakes will there be?

7) If 20 people attend the picnic, how many handshakes will there be?

8) If 100 people attend the picnic, how many handshakes will there be?

Name ___________________________________ School Team ______________________

Event 4: Mental Math (no calculators) 7th/8th grade Math Meet '09

Each answer is worth 1 pt each.

1) ________________________

2) ________________________

3) ________________________

4) ________________________

5) ________________________

6) ________________________

7) ________________________

8) ________________________

9) ________________________

10) ________________________

Example: PENCILS DOWN

$$(14 - 5) + (3 \times 3)$$

Problem 1: PENCILS DOWN

$$(12 - 4) + (5 \times 5)$$

Problem 2: PENCILS DOWN

$$16 + 15 + 14 - 7 - 6 - 5$$

Problem 3: PENCILS DOWN

$$4(4 + 1) + 2(3 + 2) + 3(7 + 3)$$

Problem 4: PENCILS DOWN

$$\frac{\sqrt{49}}{\sqrt{9}} + \frac{\sqrt{100}}{\sqrt{36}}$$

Problem 5: PENCILS DOWN

$$\frac{(45 + 16 + 55 + 4)}{8}$$

Problem 6: PENCILS DOWN

$$\frac{1}{12} + \frac{1}{?} + \frac{1}{6} = \frac{7}{12}$$

Problem 7: PENCILS DOWN

$$(1 + 2 + 3) + (2 + 3 + 4) + (3 + 4 + 5)$$

$$=$$

$$(1 + 5) + 2(2 + 4) + ?(3)$$

Problem 8: PENCILS DOWN

$$(1 + 2 + 3) + (2 + 3 + 4) + (3 + 4 + 5)$$

Problem 9: PENCILS DOWN

$$\frac{1^2 + 2^2 + 3^2 + 4^2}{5^2}$$

Problem 10: PENCILS DOWN

$$\frac{2^4 + 3^3 + 2^3 + 3^2 + 2^2}{4^2}$$

Name ______________________________________School Team _____________________

Event 5: Team Problems (with calculators)   7th/8th grade Math Meet '09

Problem 1: Traveling out west (5 pts each, no partial credit)

1) You slept 1/3 of the first leg of the trip. Your sister slept 1/ 2 of what you did. The first leg of the trip look fourteen hours. How much did you sleep in hours and minutes?

2) How much did your sister sleep in hours and minutes?

3) While traveling to the Grand Canyon, your trip takes 2days. Two-thirds of the time is spent on the road. How many hours is this?

4) From problem 3, one-sixth of the time on the road was spent on pit stops and one-fifth of the time on the road was spent on sightseeing. How much time in hours and minutes was left to spend on driving?

5) If the total trip takes 4 days, 1/3 of the time was spent driving, 1/4 of the time was spent stopping at tourist spots, 1/5 of the time was spent eating, 1/6 of the time was spent on pit stops, how much time in hours and minutes was left for loads of fun?

Name______________________________________School Team_______________________

Event 5: Team Problems (with calculators)   7th/8th grade Math Meet '09

Problem 2: The lollipop winners and losers

For all of the following probability problems, express your answer as a percent, rounded to two decimal places.

On a trip to the circus, you come upon a lollipop game. If you pull a lollipop with a red dot on the bottom of the stick, you are a winner. 1 in every 5 lollipops is a winner.

1) What is the probability that you'll get a lollipop that is a loser? ________% (1 point)

2) What is the probability that you'll get 2 losing lollipops in a row? ________% (2 points)

3) What is the probability that you'll get 3 losing lollipops in a row? ________% (2 points)

4) What is the probability that you'll get 5 losing lollipops in a row? ________% (2 points)

5) What is the probability that you'll get 10 losing lollipops in a row? ________% (2 points)

Event 5: Team Problems (with calculators) 7th/8th grade Math Meet '09

Problem 2: The lollipop winners and losers

For all of the following probability problems, express your answer as a percent, rounded to two decimal places.

On a trip to the circus, you come upon a lollipop game. If you pull a lollipop with a red dot on the bottom of the stick, you are a winner. 1 in every 5 lollipops is a winner.

6) What is the probability that when you get 2 lollipops, at least one is a winner?

________%
(3 points)

7) What is the probability that when you get 3 lollipops, at least one is a winner?

________%
(3 points)

8) What is the probability that when you get 5 lollipops, at least one is a winner?

________%
(3 points)

9) What is the probability that when you get 10 lollipops, at least one is a winner?

________%
(3 points)

10) What is the probability that when you get 10 lollipops, all are losers except the very last one?

________%
(4 points)

Name____________________________________School Team______________________

Event 5: Team Problems (with calculators)   7th/8th grade Math Meet '09

Problem 3: Getting Out West

On your trip out west, your rental car gets 27 miles/gallon. In mapquesting your route, you calculated that the cost of gas will be at an average of $1.83/gallon.

For the following questions, round your answers to two decimal places. (5pts each)

1) How many gallons of gas will you use on your first day if you travel 750 miles?

2) How much will you pay for the gas on your first day?

3) How many miles can you travel with $50.00?

4) Montana has the cheapest gas price, $1.58/gallon. You filled the 15 gallon tank in your rental car in Montana. Washington has the highest gas prices. Your next stop is a Washington gas station. How much will it be to fill your tank if the average price of gas for these two stops is $1.83/gallon?

5) How much farther could you travel on $75.00 if the average cost of gas went from $1.83/gallon to $1.68/gallon?

Name___________________________________School Team_________________________

Event 5: Team Problems (with calculators) 7th/8th grade Math Meet '09

Problem 4: Pretty Powers

Let's create a new power system called pretty powers. Any number can be raised to a pretty power. To understand how it is done, start with any number. This is the base number. Think of this number as a fraction, so the base is in the numerator. The pretty power switches its position in the fraction, so it moves to the denominator. The power is a letter that corresponds to its location in the alphabet. A is the first letter, so it represents the number 1, B is the second letter so it represents the number 2, and so on. When you get past Z, you begin again with AA, which is the number 27, BB is 28, and so on.

Here are some examples.

$2^{A} = \frac{1}{2^1} = \frac{1}{2}$ $5^{B} = \frac{1}{5^2} = \frac{1}{25}$

$2^{CC} = \frac{1}{2^{29}} = \frac{1}{536870912}$

Solve the following.

1) 7^{G} (3 pts each)

2) 1^{C} (3 pts each)

3) 4^{E} (3 pts each)

4) 0^{T} (3 pts each)

5) 2^{EE} (3 pts each)

6) -4^{D} (5 pts each)

7) $\frac{1}{3^{B}}$ (5 pts each)