

**Mount Rainier Math Invitational
Fifth Grade - February 1, 2008
Individual Test**

Student Name: _____ Team #: _____

School Name: _____

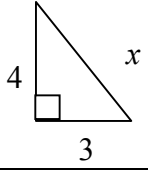
Problems 1-20		2 pts each	
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			
Subtotal			

Problems 21-30		3 pts each	
21			
22			
23			
24			
25			
26			
27			
28			
29			
30			
Subtotal			

TOTAL		
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**Mount Rainier Math Invitational
Fifth Grade - February 1, 2008
Individual Test**

Put all answers on the colored answer sheet. All fraction answers must be reduced.

Problems 1 through 20 are worth 2 points each	
1	What is the sum of 1612 and 9435?
2	Evaluate: 170×59
3	Solve for x : $3x + 8 = 29$
4	What is the distance of the line segment from $(0, 53)$ to $(0, 476)$?
5	Find the area of a rectangle with sides seven and thirteen.
6	Evaluate: $64 \div 4 + 12 - 3 \times (4 + 4)$
7	What is the volume of a cube with side length 5?
8	What is the sum of the first five prime numbers?
9	Berta is shorter than Kelsey, who is shorter than Abbdule. Stacey is taller than Berta. Stacey has a cat. Abbdule is 2' 2" taller than Berta, who is 3" shorter than Kelsey, who is an inch shorter than Stacey. If Abbdule is 7' 2", how tall is Stacey, in inches?
10	What is the next term in the sequence 1, 9, 25, 49, 81, ...?
11	Every time Abbdule takes a step, Verda must hop four times to keep up. For every hop of Verda's, Stacey must jump rope two times. For each of Stacey's jumps, Kelsey must pogostick five times. How many times must Kelsey pogostick for each of Abbdule's steps?
12	<div style="display: flex; align-items: center;">  <div style="margin-left: 20px;"> <p>What is the name of the side with length x?</p> </div> </div>
13	What is the length of x in the triangle from question 12?
14	What is the measure of the angle between the hour and the minute hand at six o'clock?
15	Jonne, Jakob, and Jinngul went to a store that sells three different types of spaghetti sauce. They want to get the most sauce for their money. The Heimer sauce is \$2 for 15.5 fl oz, the Schmidt sauce is \$6 for 30 fl oz, and the Barbossa is \$3 for 18 fl oz. How much would it cost for them to buy two jars of sauce with a 10% off coupon before tax?

16	Stacey has three pairs of pants, four shirts, and x pairs of socks. How many pairs of socks does Stacey have if she has twelve outfits? (An outfit is made of one pair of pants, one shirt, and one pair of socks).
17	What percent of 700 is 35?
18	Solve for x : $4x + 2x + x + \frac{1}{2}x + \frac{1}{3}x + \frac{1}{6}x = \frac{2^6}{2^2}$
19	Hillary bakes a plate of macaroons. Berduhh eats half of the macaroons, then Zoey (Kelsey's dog) eats a fourth of the remaining macaroons. Finally, Octagonne (Berduhh's pet spider) eats 10 of the macaroons. Unfortunately, Hillary only has two macaroons left. How many did she originally bake?
20	Every time Kelsey gets angry, she cuts off three inches of hair. She gets angry every time Hillary pops her gum or Stacey screams. For every time Hillary pops her gum, Stacey screams two times. If Hillary pops her gum four times, and Kelsey has 38 inches of hair, how long is Kelsey's hair after the whole ordeal?
	Problems 21 through 30 are worth 3 points each
21	Trevor is sick with a common cold. At the very beginning of his illness, he uses 5 tissues for the first 5 minutes. During every 5 minutes he uses 5 more tissues than he did the time before. If a box contains 600 tissues, how many minutes does it take him to use an entire box?
22	What is the surface area of a cube with side length 3?
23	How many times does seven evenly go into 43,104,685,924,027?
24	Evaluate and express as a mixed number: $1 + \frac{1}{2} + \frac{1}{3} + \frac{1}{4} + \dots + \frac{1}{8}$
25	How many diagonals does regular octagon have?
26	Kelsey is hungry, so she decides to see what is in her fridge, where there are plenty of sandwich ingredients, so she is going to make a sandwich. There are 2 types of bread, 3 types of meat, 4 types of cheese, and 5 types of vegetables. How many distinct sandwiches can Kelsey make and eat if a sandwich consists of one type of bread, one type of meat, and one type of cheese?
27	There are five fish: Anna, Burdeh, Catherine, David, and Eric. The owner, Trevor, feeds them every day with fifty fish flakes. Anna, Burdeh, and Catherine eat at the rate of five fish flakes per minute. Eric eats at ten fish flakes per minute and David, who is anorexic, doesn't eat any. How long does it take for them to eat the fifty fish flakes?
28	Order the following from largest to smallest: 2^{33} , 3^{22} , 4^{16}

29	What is the mean of the mean, median, and mode of: {6, 14, 63, 95, 42, 1, 7, 6}? Express your answer as a mixed number.
30	Find the sum of the integers greater than -11 and less than 1.

Mount Rainier Math Invitational
Fifth Grade - February 1, 2008
Individual Test

Student Name: KEY

Team #: KEY

School Name: _____

Problems 1-20		2 pts each	
1	11047		
2	10030		
3	7		
4	423		
5	91		
6	4		
7	125 [units ³]		
8	28		
9	64		
10	121		
11	40		
12	Hypotenuse		
13	5		
14	180[°]		
15	\$3.60		
16	1		
17	5 [%]		
18	2		
19	32		
20	2		
Subtotal			

Problems 21-30		3 pts each	
21	75		
22	54		
23	6,157,812,274,861		
24	$2\frac{201}{280}$		
25	20		
26	24		
27	2 [minutes]		
28	$3^{22}, 2^{33}, 4^{16}$		
29	$10\frac{2}{3}$		
30	-55		
Subtotal			

TOTAL		
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**Mount Rainier Math Invitational
Fifth Grade - February 1, 2008
Team Algebra Test**

School Name: _____ Team #: _____

Problems 1-5		2 pts each	
1			
2			
3			
4			
5			
Subtotal			

Problems 6-10		3 pts each	
6			
7			
8			
9			
10			
Subtotal			

TOTAL		
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**Mount Rainier Math Invitational
Fifth Grade - February 1, 2008
Team Algebra Test**

Put all answers on the colored answer sheet. All fraction answers must be reduced.

Problems 1 through 5 are worth 2 points each	
1	Solve for x: $12x - 3 = 3x + 3$
2	A salesperson sells 11 record albums per hour. If she worked 8 hours a day, about how many record albums did she sell in five days?
3	Anna is working to get enough money for a purse. If she is paid \$15 dollars an hour and if she completes the assigned project in one week she receives a \$100 bonus. If she works a 40 hour week and completes the project within the week time-limit, what is her total pay for the week?
4	On a farm there are 20 animals (an assortment of cows and chickens) with a total of 74 legs. How many cows are there?
5	What comes next in this sequence? 1, 1, 2, 3, 5, 8...
Problems 6 through 10 are worth 3 points each	
6	If 1 out of every 80 bottles had a defect, how many defective bottles were in a shipment of 1,200 bottles?
7	Matt is coo-coo for cookies. Just yesterday, he bought a 55-lb box of cookies for \$75.35. What is the price per pound for this box of cookies?
8	Matt and Ryan were having a competition to see who could guess correctly the outcome for more coin tosses. If five fair coin tosses take place, what is the probability of Matt getting them all right if he guesses heads for all five tosses?
9	If Anna wants to buy a \$35 purse and the sales tax is 8% how much will she have to pay at the register?
10	If Iggy the interesting iguana travels at 4 miles per hour, how many miles will he travel between 7:30am and 2:15pm? Consider Iggy stops at the Rainbow Cafe for lunch from 11:45am to 12:15pm.

**Mount Rainier Math Invitational
Fifth Grade - February 1, 2008
Team Algebra Test**

School Name: KEY

Team #: KEY

Problems 1-5		2 pts each	
1	2/3		
2	440		
3	700		
4	17		
5	13		
Subtotal			

Problems 6-10		3 pts each	
6	15		
7	\$1.37		
8	1/32		
9	\$37.80		
10	25 [miles]		
Subtotal			

TOTAL		
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**Mount Rainier Math Invitational
Fifth Grade - February 1, 2008
Team Geometry Test**

School Name: _____ Team #: _____

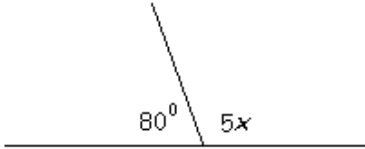
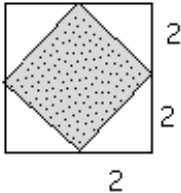
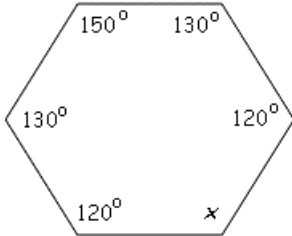
Problems 1-5		2 pts each	
1			
2			
3			
4			
5			
Subtotal			

Problems 6-10		3 pts each	
6			
7			
8			
9			
10			
Subtotal			

TOTAL		
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**Mount Rainier Math Invitational
Fifth Grade - February 1, 2008
Team Geometry Test**

Put all answers on the colored answer sheet. All fraction answers must be reduced

Problems 1 through 5 are worth 2 points each	
1	How many degrees are there in the interior of an isosceles triangle?
2	What is the sum of the length of the edges of a cube with side length of 3?
3	What is the perimeter of a square with area 16?
4	What is the area of a right triangle with hypotenuse 13 and one leg length of 12?
5	What is the value of x in the figure below? <div style="text-align: center;">  </div>
Problems 6 through 10 are worth 3 points each	
6	Sixty-four plain wooden cubes are assembled into one larger cube that is four on a side. If the outside is painted and then disassembled, what is the positive difference between the number of cubes painted on a single side minus the number of cubes with no faces painted?
7	How many triangles with integer side lengths are possible if one side length is 4 and another is 6?
8	What is the area of the grey shaded square inside a larger square of the figure below? <div style="text-align: center;">  </div>
9	How many squares can be formed from a chessboard of 5 units by 5 units?
10	What is the value of x in the concave hexagon below? <div style="text-align: center;">  </div>

**Mount Rainier Math Invitational
Fifth Grade - February 1, 2008
Team Geometry Test**

School Name: KEY

Team #: KEY

Problems 1-5		2 pts each	
1	180		
2	36		
3	16		
4	30		
5	20 [°]		
Subtotal			

Problems 6-10		3 pts each	
6	16		
7	7		
8	8		
9	55		
10	70 [°]		
Subtotal			

TOTAL		
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**Mount Rainier Math Invitational
Fifth Grade - February 1, 2008
Team Pressure Round**

School Name: _____ Team #: _____

Round	1	2	3	4	5
Question #					
Points	0 or 3	0 or 4	0 or 5	0 or 6	0 or 7
				Total	

**Mount Rainier Math Invitational
Fifth Grade - February 1, 2008
Team Pressure Round**

School Name: _____ Team #: _____

Round	1	2	3	4	5
Question #					
Points	0 or 3	0 or 4	0 or 5	0 or 6	0 or 7
				Total	

Mount Rainier Math Invitational
Fifth Grade - February 1, 2008
Team Pressure Round

School Name: _____ Team #: _____

Round # 1

Question #	Answer

Mount Rainier Math Invitational
Fifth Grade - February 1, 2008
Team Pressure Round

School Name: _____ Team #: _____

Round # 1

Question #	Answer

Mount Rainier Math Invitational
Fifth Grade - February 1, 2008
Team Pressure Round

School Name: _____ Team #: _____

Round # 2

Question #	Answer

Mount Rainier Math Invitational
Fifth Grade - February 1, 2008
Team Pressure Round

School Name: _____ Team #: _____

Round # 2

Question #	Answer

**Mount Rainier Math Invitational
Fifth Grade - February 1, 2008
Team Pressure Round**

School Name: _____ Team #: _____

Round # 3

Question #	Answer

**Mount Rainier Math Invitational
Fifth Grade - February 1, 2008
Team Pressure Round**

School Name: _____ Team #: _____

Round # 3

Question #	Answer

**Mount Rainier Math Invitational
Fifth Grade - February 1, 2008
Team Pressure Round**

School Name: _____ Team #: _____

Round # 4

Question #	Answer

**Mount Rainier Math Invitational
Fifth Grade - February 1, 2008
Team Pressure Round**

School Name: _____ Team #: _____

Round # 4

Question #	Answer

**Mount Rainier Math Invitational
Fifth Grade - February 1, 2008
Team Pressure Round**

School Name: _____ Team #: _____

Round # 5

Question #	Answer

**Mount Rainier Math Invitational
Fifth Grade - February 1, 2008
Team Pressure Round**

School Name: _____ Team #: _____

Round # 5

Question #	Answer

**Mount Rainier Math Invitational
Fifth Grade - February 1, 2008
Team Pressure Round**

Put all answers on the colored answer sheet. All fraction answers must be reduced. The first answer submitted is worth 3 points, the second 4 points, ..., and the Fifth answer is worth 7 points. You may turn in your answers in any order but each question may only be answered once!

1	Evaluate: $(9-1)(8-1)(7-1)(6-1)(5-1)(4-1)(3-1)(2-1)(1-1)$
2	How many palindromes are between 1000 and 10000, inclusive? (A palindrome reads the same backwards as forwards.)
3	What is the remainder when 1,001,123,234 is divided by 13?
4	A right triangle has a hypotenuse length of 35 and one leg length of 21. What is the length of the other leg?
5	Bertha has a favorite number. It's special because it may be represented $ab + c$, where a is the smallest prime number cubed, b is the second smallest prime number squared, and c is the fourth smallest prime number. What is Bertha's favorite number?

Mount Rainier Math Invitational
Fifth Grade - February 1, 2008
Team Pressure Round

School Name: KEY

Team #: KEY

1	0
2	90
3	7
4	28
5	79

**Mount Rainier Math Invitational
Fifth Grade - February 1, 2008
Team "Who Wants to be a Mathematician"**

School Name: _____ Team #: _____

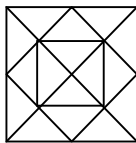
Problems 1-4		1 pt each		
1				
2				
3				
4				
Problems 5-8		2 pts each		
5				
6				
7				
8				
Problems 9-11		3 pts each		
9				
10				
11				
Problem 12		4 pts		
12				

TOTAL	
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**Mount Rainier Math Invitational
Fifth Grade - February 1, 2008
"Who Wants to be a Mathematician"**

Put all answers on the colored answer sheet. Answers left blank will not be scored; any wrong answer will result in no further answer being scored. Be careful, check your work and don't guess!

Problems 1 through 4 are worth 1 point each	
1	Anna has 5 apples, Catherine has 3, Matt has 2, and Ryan has 10. If they share the apples so that everyone gets an equal amount how many letters are in the word "fidgety?" A) 15 B) 5 C) 4 D) 7
2	What is the name of the shape with 9 sides? A) Triangle B) Hexagon C) Nonagon D) Googolplex-agon
3	Reduce the fraction: 1000/10000 A) 1/10 B) 10/100 C) 100/1000 D) 10
4	What is the area of a rectangle with sides of length 7 and 11? A) 66 B) 77 C) 88 D) 99
Problems 5 through 8 are worth 2 points each	
5	How many prime numbers between 100 and 1000 are divisible by 2? A) 500 B) 100 C) 1 D) 0
6	Trung is thinking of a number. If he squares this number, the outcome is 121. If he subtracts this number from 5, the difference is 16. What is the number Trung is thinking of? A) 11 B) 8 C) -11 D) -8
7	What is four times the sum of the perimeters of a square with an area of 121 and a square with an area of 169? A) 72 B) 96 C) 384 D) 768
8	Trung has 2 jars of marbles, Jar A and Jar B, each consisting of the colors red, blue, and yellow. If each jar has 5 red marbles, 4 blue marbles, and 3 yellow marbles; what is the probability of drawing a blue marble from Jar A and a yellow marble from Jar B? A) 1/2 B) 1/12 C) 1/144 D) 3/4

	Problems 9 through 11 are worth 3 point each
9	<p>Eric is painting the four outer walls of his uncle's shed. The front and back walls are 10ft x 15ft and the two side walls were 10ft x 20ft. However Eric was asked not to paint the two 2ft x 3ft windows and the 3ft x 7ft door on the front wall. How much wall did Eric end up painting?</p> <p>A) 627 ft² B) 653 ft² C) 667 ft² D) 693 ft²</p>
10	<p>Using small cubes with side lengths of 2 units, I constructed a larger cube with a volume of 216 units cubed. How many small cubes did I use to construct the larger cube?</p> <p>A) 13 B) 54 C) 108 D) 27</p>
11	<p>Evaluate: $999999999+888888888+777777777+6666666+55555+4444+333+22+1$</p> <p>A) 109739365 B) 108739365 C) 107739365 D) 106739365</p>
	Problem 12 is worth 4 points
12	<p>How many triangles are in this figure?</p> <div style="text-align: center;">  </div> <p>A) 36 B) 32 C) 28 D) 24</p>

**Mount Rainier Math Invitational
Fifth Grade - February 1, 2008
Team "Who Wants to be a Mathematician"**

School Name: **KEY** Team #: **KEY**

Problems 1-4		1 pt each		
1	D			
2	C			
3	A			
4	B			
Problems 5-8		2 pts each		
5	C			
6	D			
7	C			
8	B			
Problems 9-11		3 pts each		
9	C			
10	D			
11	A			
Problem 12		4 pts		
12	B			

TOTAL	
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Mount Rainer Math Invitational
February 1, 2008
Puzzle Answers

- 1) A cannot be True since then B would be True and we would have two statements True so A and B are False which makes C False as well. Since B is False, there must be 2 True Statements namely D and E.

- 2) $2178 \times 4 = 8712$

- 3) There are several combinations of three numbers that multiply to get 72: $1 \times 1 \times 72$, $1 \times 6 \times 12$, etc. They all have unique sums though except $2 \times 6 \times 6$ and $3 \times 3 \times 8$. The first case does not have an oldest child (they are twins) so the ages must be 3, 3 and 8.

Mount Rainer Math Invitational
February 1, 2008
Puzzles

Name: _____

School: _____

Team#: _____

- 1) Read the following 5 statements very carefully:
(A): Statement (B) is true.
(B): No more than one statement is true out of statements (A), (B), (C), (D), and (E).
(C): All the statements (A), (B), (C), (D), and (E) are true.
(D):
(E):
Statements (D) and (E) are written with a magic ink so that they are not visible to those who do not tell the truth all the time. Which ones of the statements (A), (B), (C), (D), and (E) are true?

- 2) In the following multiplication problem, A, B, C and D are digits: $(ABCD) \times 4 = (DCBA)$. What is ABCD?

- 3) I was talking to a friend who told me he had three children whose ages multiplied to 72. That wasn't enough information for me to guess their ages, so he told me the sum of their ages. That still wasn't enough information. Finally, he said the oldest child liked math and then I knew their ages. How old were the three children?