

**Mount Rainier Math Invitational
Sixth Grade - January 28, 2005
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			

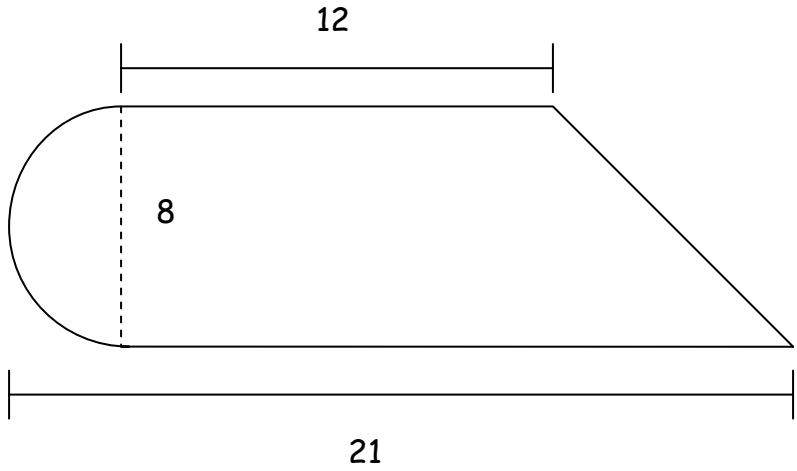
TOTAL		
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Mount Rainier Math Invitational
Sixth Grade - January 28, 2005
Individual Test

written by Kate Iwamoto and Michelle Fong

Put all answers on the colored answer sheet. All fraction answers must be reduced. You should leave appropriate answers in terms of π .

Problems 1 through 20 are worth 2 points each	
1	Find the difference between 823 and 384.
2	How many sides does a heptagon have?
3	What is the positive square root of 4?
4	In a right triangle with a 60° angle, how many degrees are in the other acute angle?
5	In a rectangle that has an area of 36 square inches and length 4 inches, what is the width in inches?
6	Evaluate: $2560 + 1234 + 6543 - 2560 - 6543 - 1234$
7	Find the product of 25 and 12.
8	What does the expression $5 - 3(2 \cdot 1) + 6^2 - 1$ equal?
9	What is the probability of drawing a red card out a standard deck of 52 cards?
10	Farmer Bob has chickens and pigs. In the farmyard, he counts 70 legs and 22 animals. How many chickens does he have?
11	What is the length of the hypotenuse in a right triangle with two legs with lengths 5 feet and 12 feet?
12	What is the probability of flipping a coin twice and getting two heads in a row?
13	How many seconds are in 3.5 minutes?
14	There are 5 whoopies in 12 whirlies. How many whoopies are there in 60 whirlies?
15	I have 5 chocolate bars and 12 friends and I give 4 chocolate bars to my friends to split equally among themselves. How much of a chocolate bar do they each get?
16	If Long rolls 2 dice, what is the probability that he will roll a sum of 7?
17	Vladimir Radmonovic makes \$5.23 an hour when he sleeps. How much money does he make if he sleeps for 4 hours?
18	Evaluate: $(3! + 2!) \cdot 2!$

19	In a basketball team with 12 players that all shake each other's hand exactly once, how many handshakes take place?
20	Round 599,999 to the nearest thousand place.
	Problems 21 through 30 are worth 3 points each
21	If Michelle can mow a lawn in 6 hours and Kate can mow a lawn in 3 hours, how long, in hours, will it take them to mow a lawn together?
22	How many distinct ways are there to arrange the letters in the word FRISBEE?
23	What is the area of a trapezoid with bases of lengths 10 inches and 20 inches and a height of 12 inches?
24	In a circle with area 49π square feet, what is the diameter in feet?
25	What is x if $25x - 34 = 16 + 9x$?
26	How many $3'' \times 3''$ tiles are needed to tile a floor measuring $4' \times 4'$?
27	Allen Iverson climbs a mountain. Every day he goes up 1,200 feet and every night he slides down 13 inches. If the very tall mountain is 200,000 feet high, how many days will it take for him to reach the top of the mountain?
28	What is the 13th number in the following sequence: 14, 16, 19, 23, 28...?
29	What is the slope of the line perpendicular to the line $y = 54x + 23$?
30	<p>What is the area of the following figure (the shape on the left is a semi-circle and the top and bottom lines of the shape are parallel)?</p> 

**Mount Rainier Math Invitational
Sixth Grade - January 28, 2005
Individual Test**

Student Name: **KEY**

Team #: **KEY**

School Name: _____

Problems 1-20		2 pts each	
1	439		
2	7 [sides]		
3	2		
4	30 [degrees]		
5	9 [inches]		
6	0		
7	300		
8	34		
9	1/2		
10	9 [chickens]		
11	13 [feet]		
12	1/4		
13	210[seconds]		
14	25[whoopies]		
15	1/3		
16	1/6		
17	[\$] 20.92		
18	16		
19	66		
20	600,000		
Subtotal			

Problems 21-30		3 pts each	
21	2 [hours]		
22	2,520 [ways]		
23	180 [sq in]		
24	14 [feet]		
25	25/8		
26	256 [tiles]		
27	167 [days]		
28	104		
29	-1/54		
30	116+8π [sq u]		
Subtotal			

TOTAL		
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**Mount Rainier Math Invitational
Sixth Grade - January 28, 2005
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
Sixth Grade - January 28, 2005
Team Algebra Test
written by Rachel Haller

Put all answers on the colored answer sheet. All fraction answers must be reduced. You should leave appropriate answers in terms of π .

Problems 1 through 5 are worth 2 points each	
1	Solve for y : $2y+37=47$
2	You have spiders and ostriches. There are five heads and 28 legs. How many ostriches are there?
3	Neff and Mak are racing. Neff can "run" at 2 mph. Mak can walk on his hands at 4 mph. By the time Neff has "run" 1.5 miles, how far has Mak gone?
4	The length of one leg (shorter side) of a right triangle is 7 units. The square of the hypotenuse is 50 units. How long is the other leg?
5	There are 7 red marbles and 8 green marbles in a bag. What is the probability of drawing 9 green marbles in a row without replacement?
Problems 6 through 10 are worth 3 points each	
6	I have seven yellow socks, thirteen green socks, 27 red socks, and eight pink polka-dot socks in a box. How many must I randomly select to ensure a match?
7	Andrew and Anna are "cleaning" the classroom. Andrew takes five hours to <u>mess</u> up the room while Anna takes one hour to <u>clean</u> it. How long will they take together (in minutes) until the room is clean?
8	My dad likes a 50% oil - 50% vinegar salad dressing. I like it to be 60% vinegar. How many ounces pure vinegar do I need to add to 16 ounces of his 50-50 mix to get the dressing I like?
9	Five friends are going to a movie. If Chick must sit on the aisle because of his enormous cranium, how many ways can the other four friends sit so that everyone sits together?
10	Solve for x : $x^2-2x+1=0$

**Mount Rainier Math Invitational
Sixth Grade - January 28, 2005
Team Algebra Test**

School Name: KEY

Team #: KEY

Problems 1-5		2 pts each	
1	5		
2	2		
3	3		
4	1		
5	0		
Subtotal			

Problems 6-10		3 pts each	
6	5		
7	75		
8	4		
9	24		
10	1		
Subtotal			

TOTAL		
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**Mount Rainier Math Invitational
Sixth Grade - January 28, 2005
Team Geometry Test**

School Name: _____ Team #: _____

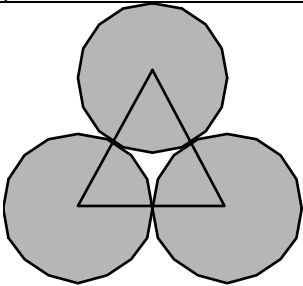
Problems 1-5		2 pts each	
1			
2			
3			
4			
5			
Subtotal			

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

TOTAL		
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Mount Rainier Math Invitational
Sixth Grade - January 28, 2005
Team Geometry Test
 written by Jerrad Neff

Put all answers on the colored answer sheet. All fraction answers must be reduced. You should leave appropriate answers in terms of π .

Problems 1 through 5 are worth 2 points each	
1	In a 10cm by 10cm, 5x5 checkerboard of alternating red and black squares, (with red on the corners,) what is the total area of the red squares (in centimeters)?
2	If a right triangle has legs of length 9 and 12, what is the length of the hypotenuse?
3	How many lines of symmetry does a hexagon have?
4	What is the largest area, in meters, you can encompass with just 20 meters of fencing?
5	How many times can 8 lines intersect each other on a single plane?
Problems 6 through 10 are worth 3 points each	
6	Two sides of a triangle are 6 and 10 units long. What is the sum of all possible whole number side lengths the third side could be?
7	<div style="display: flex; align-items: center;">  <div style="margin-left: 20px;"> <p>In the figure at left, assuming the triangle is equilateral with a perimeter of 24 and the centers of the circles are on the triangle's vertices, what is the area of the shaded region?</p> </div> </div>
8	What is the next number in the following geometric sequence: 27, 18, 12, 8...?
9	<p>Mak^{II} has 90 Xboxes. If he wants to arrange them in 2 equally sized triangles like the one shown below, how many rows will be in each triangle?</p> <div style="text-align: center;"> <p>[X]</p> <p>[X] [X]</p> <p>[X] [X] [X]</p> <p>[X] [X] [X] [X]</p> </div>
10	Master Chief runs 6 miles south, 5 miles east, 20 miles north, 10 miles west, and then 2 miles south to pick up the Warthog. If the Warthog can go 52 miles per hour, how long (in minutes) will it take Master Chief to go straight back to his original location?

**Mount Rainier Math Invitational
Sixth Grade - January 28, 2005
Team Geometry Test**

School Name: KEY

Team #: KEY

Problems 1-5		2 pts each	
1	52 [cm ²]		
2	15		
3	6		
4	100/π [m ²]		
5	28		
Subtotal			

Problems 6-10		3 pts each	
6	110		
7	48π [cm ²]		
8	16/3		
9	9		
10	15 [minutes]		
Subtotal			

TOTAL		
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**Mount Rainier Math Invitational
Sixth Grade - January 28, 2005
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
Sixth Grade - January 28, 2005
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
Sixth Grade - January 28, 2005
Team Pressure Round**

School Name: _____ Team #: _____

Round # 1

Question #	Answer

**Mount Rainier Math Invitational
Sixth Grade - January 28, 2005
Team Pressure Round**

School Name: _____ Team #: _____

Round # 1

Question #	Answer

**Mount Rainier Math Invitational
Sixth Grade - January 28, 2005
Team Pressure Round**

School Name: _____ Team #: _____

Round # 2

Question #	Answer

**Mount Rainier Math Invitational
Sixth Grade - January 28, 2005
Team Pressure Round**

School Name: _____ Team #: _____

Round # 2

Question #	Answer

**Mount Rainier Math Invitational
Sixth Grade - January 28, 2005
Team Pressure Round**

School Name: _____ Team #: _____

Round # 3

Question #	Answer

**Mount Rainier Math Invitational
Sixth Grade - January 28, 2005
Team Pressure Round**

School Name: _____ Team #: _____

Round # 3

Question #	Answer

**Mount Rainier Math Invitational
Sixth Grade - January 28, 2005
Team Pressure Round**

School Name: _____ Team #: _____

Round # 4

Question #	Answer

**Mount Rainier Math Invitational
Sixth Grade - January 28, 2005
Team Pressure Round**

School Name: _____ Team #: _____

Round # 4

Question #	Answer

**Mount Rainier Math Invitational
Sixth Grade - January 28, 2005
Team Pressure Round**

School Name: _____ Team #: _____

Round # 5

Question #	Answer

**Mount Rainier Math Invitational
Sixth Grade - January 28, 2005
Team Pressure Round**

School Name: _____ Team #: _____

Round # 5

Question #	Answer

Mount Rainier Math Invitational
Sixth Grade - January 28, 2005
Team Pressure Round

written by Catherine Tart and Chanel Fuchigami

Put all answers on the colored answer sheet. All fraction answers must be reduced. You should leave appropriate answers in terms of π . 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	What is the perimeter of a rhombus whose diagonals measure 6 and 8 units?
2	Chanel had a standard deck of cards with 52 cards. Only, her sister, Hannah, stole all of the 3's. With her new deck of cards, what is the probability of drawing a red king or a seven?
3	Mrs. Jingleheimer lives 2 miles from the bean-stalk kiosk. The first time she ventured to the kiosk, she got half way when she remembered she forgot her sunglasses and scooted back home to get them. But after traveling 1 mile on the way to the kiosk, she realized she had dropped her lip gloss and went half a mile back to retrieve them. Finally, she scooted the rest of the way to the kiosk. After purchasing her bean-stalk, half way home, she realized she had forgotten her quill at the kiosk and scooted back to pick it up, and finally scooted two miles home. How many miles did Mrs. Jingleheimer scooter, in total, that day?
4	If Catherine has bought a pizza with diameter of 20. Trevor scarffed down $\frac{3}{5}$ of the pizza. Chanel ate $\frac{1}{4}$ of what was left. Mr. Tosch then ate $\frac{2}{3}$ of what was left. In terms of π , how much pizza is left for Catherine?
5	What is $48+12\div 3\times 2-6$?

Mount Rainier Math Invitational
Sixth Grade - January 28, 2005
Team Pressure Round

School Name: KEY

Team #: KEY

1	20
2	$\frac{1}{8}$
3	9
4	10π
5	50

**Mount Rainier Math Invitational
Sixth Grade - January 28, 2005
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
Sixth Grade - January 28, 2005
"Who Wants to be a Mathematician"
written by Ben Mitchell, Alan Mak, Tony Chick

Put all answers on the colored answer sheet. Any wrong answer will result in the loss of all points after the last "safe" zones - after questions 4 and 8. If you do not know an answer, you may safely skip the question by answering "LL" to at most two questions. You do not receive credit for a "LL" but it does not count as a wrong answer.

Problems 1 through 4 are worth 1 point each	
1	How many sides does a triangle have? A) 1 B) 2 C) 3 D) 13
2	What is $7 \cdot 11$? A) 18 B) 77 C) 71 D) 17
3	If Bri has 6 green apples, 9 red apples, and 1 yellow apple, how many total apples does she have? A) 12 B) 30 C) 16 D) 22
4	Evaluate: $7 + 3 \cdot 5 - 1$ A) 49 B) 40 C) 21 D) 8
Problems 5 through 8 are worth 2 points each	
5	Mak decides to go hunting for "snitches." If he catches 3 of every 11 snitches when he goes hunting, how many snitches will he catch if he sees 6798 snitches? A) 2492 B) 1854 C) 1855 D) 1492
6	Ben has a perfectly square pizza with a side of 1.7 feet. What is the area of the pizza that Ben is about to devour, rounded to the nearest tenth of a square foot? A) 1.7 B) 2.89 C) 3 D) 2.9
7	Tony is trying to write out the sentence "Pi is three." Ignore the period and capital letters, how many ways could he <i>incorrectly</i> write the sentence, assuming he gets the correct letters in each word, and the word order is the same? A) 19 B) 119 C) 239 D) 90719
8	What is the 47 th number in this sequence: 1,2,3,4,5,6,7,8,9,10,12,13,14,15,16,17,18,19,20,21,23...? A) 47 B) 43 C) 55 D) 51

Problems 9 through 11 are worth 3 point each	
9	<p>Jon, Keyes, and Johnson each toss a fair coin and then Jon rolls a fair 7-sided die. What is the probability that they get two heads and a tails, and that Jon rolls a 4 or 5 on the die?</p> <p>A) $\frac{3}{28}$ B) $\frac{1}{2}$ C) $\frac{1}{24}$ D) $\frac{5}{8}$</p>
10	<p>What is the area of an isosceles trapezoid the bases of 10 and 18 and other sides that are both 5?</p> <p>A)42 B)40 C)52 D)50</p>
11	<p>Ben, Mak, Tony, and Neff are having a race around a 1-mile circular track. Ben runs at a speed of 10 miles per hour, Mak runs at a speed of 7 miles per hour, Tony runs at a speed of 6 miles per hour, and Neff walks at a speed of 2 miles per hour. Ben runs all the way around the track. Mak, never wanting to lose, runs the first quarter mile, cuts straight across the field in the middle, and runs the last quarter mile. Tony runs half and then quits. Neff walks one-tenth of a mile straight back from the starting line, gets in his car, then drives back to the track and drives around the track at a speed of 40 miles per hour. Who reaches the finish line first?</p> <p>A) Mak B) Ben C) Tony D) Neff</p>
Problem 12 is worth 4 points	
12	<p>Mak rolls two fair six-sided dice. Tom noticed that at least one of the die showed a six. What is the probability that the sum was a multiple of 3.</p> <p>A) $\frac{1}{4}$ B) $\frac{3}{11}$ C) $\frac{4}{11}$ D) $\frac{1}{3}$</p>

**Mount Rainier Math Invitational
Sixth Grade - January 28, 2005
Team "Who Wants to be a Mathematician"**

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

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

TOTAL	
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