

**2004 Mount Rainier Math Invitational
Fifth Grade Individual Test**

Written by Rachel Haller, Michelle Fong, Kate Iwamoto

Reduce all fractions and answers should be left in terms of π .

Questions 1-20 are worth 2 points each

1. What is the area of a square with a side length of 4?
2. How many positive prime numbers are there less than 10?
3. What is the mode of the following set: 2,3,7,4,2,7,5,8,2,7,6,7?
4. $212 - 91 = ?$
5. What is the least common multiple of 4 and 6?
6. What is the area of a triangle with base 4 and height 4?
7. If oranges are 5 for \$1 how many could you buy with \$0.60?
8. If you have 6 blue marbles and 4 red marbles in a bag and you draw one randomly from the bag without looking what is the probability of drawing a blue marble?
9. What is 117 divided by 9
10. How many faces are there on a cube?
11. What is the mean (or average) of the following set of numbers:
{10, 13, 52, 63, 2}?
12. What is the greatest common factor of 12 and 20?
13. What is the area of a circle with radius 9?

(next page)

14. If a wood chuck can chuck 6 chucks of wood in one hour, how much wood could he chuck in 4 hours?
15. What is the probability of getting an even number when rolling a single fair 6-sided die?
16. Solve for x when y equals 6: $\frac{1}{2}x + \frac{2}{3}y = 9$
17. There are five people in a room. How many handshakes occur if everyone shakes hands with each other person once?
18. What is $\frac{1}{2} + \frac{1}{3} + \frac{1}{4}$?
19. How many degrees are in one interior angle of a regular pentagon?
20. What is $5 \times 4 \div 3 \times 2 \div 1$?

Questions 21-30 are worth 3 points each

21. What is the area of a trapezoid with a height of 6 inches, one base that measures seven inches, and another base that is nine inches long?
22. There are 6 red pens, 4 blue pens, and 2 black pens in a jar. If drawn randomly, what are the chances that a blue pen is drawn?
23. How many inches are in 6 miles?
24. How many diagonals are in a convex decagon? (A 10-sided figure)
25. Mary has a standard deck of 52 playing cards. What are the chances that she will draw a red King or a diamond?
26. A farmer owns chickens and pigs. When he counts his animals, he notices that there are 60 heads and 146 legs. How many pigs does the farmer own?

(next page)

27. Fred owns a baseball card collection. He gave a third of his collection to his friend Bobby and then, Fred gave Sue half of the baseball cards that he had left. Fred then gave Johnny 12 cards and was left with 6 cards. How many baseball cards did Fred originally own?
28. How many cubic inches are in the volume of a cube with side length 3 inches?
29. In terms of π , what is the area of a circle with a circumference of 16 centimeters?
30. Carrie has \$2.90 in quarters, dimes, and nickels. She has 28 coins and the number of quarters and nickels added together equals the number of dimes. There are 10 more dimes than there are quarters. How many quarters does Carrie have?

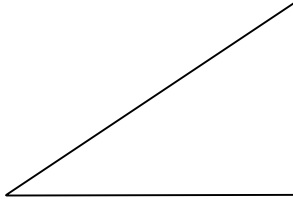
**2004 Mount Rainier Math Invitational
Fifth Grade Team Geometry**

Written by Jon Hughes

Leave answers in terms of π or use 3.14

Questions 1-5 are worth 2 points each

1. How many sides does a pentagon have?
2. How many degrees are there in one angle of an equilateral triangle?
3. What is the length of the hypotenuse of this right triangle if the bases are of length 6 and 8?



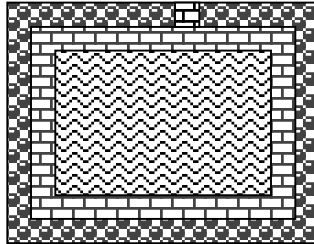
4. If a square has a perimeter of 8, then what is its area?
5. If a circle is cut in half, through its diameter, what is it called?

Questions 6-10 are worth 3 points each

6. What is the number of sides of a regular octagon multiplied by the degree measure of one exterior angle of that octagon?
7. If a square is inscribed in a circle, then what is the area of the region outside of the square, but inside of the circle, if the circle has a radius of 2?
8. If an isosceles triangle has one angle that measures 110 degrees, what is the measure of another angle?

(turn over)

9. If a queen piece is on the corner square of an 8 by 8 square chess board and can move horizontally, vertically or diagonally, then how many different squares could the queen jump to on one move? (if there are no other pieces on the board)
10. If a two foot wide path goes all the way around a pool, and a two foot wide garden goes all the way around this path (except for a two foot wide path through the garden shown below), then what is the area in square feet of the garden if the pool is 20 feet wide and 30 feet long?



**2004 Mount Rainier Math Invitational
Fifth Grade Team Algebra**

Written by Aeriq

Questions 1-5 are worth 2 points each

1. What is the value of x given $2x=4$?
2. Nuts are Jon's favorite food. They satisfy his any mood. If he gets 100 nuts and eats five each day Mondays through Fridays and seven on Saturdays and Sundays, how many nuts will he have left after two weeks?
3. What is the remainder when 817295 is divided by 5
4. What is the greatest common factor of 13 and 26?
5. Evaluate: $1.28427 + 0.46372 - 0.49$

Questions 6-10 are worth 3 points each

6. How many real 3 letter words can you write using the letters R,A, and T? (note TRA as in tra la la la la is not a word)
7. Find the next term in the sequence: 1, 8, 27, 64,___
8. Rian has 3 skirts, 2 pairs of socks, 6 shirts, and 3 hair ribbons. Assuming Rian wears 1 skirt, 1 pair of sock, 1 shirt, and 1 hair ribbon, how many different combinations are possible?
9. What is the probability of first drawing a red King , putting the card back into the deck, and then drawing a red Ace out of a standard deck containing 52 cards?
10. Solve for x : $-2(-4x-2[x-4(2x-3!)+7]+62)=20$

2004 Mount Rainier Maph Invitational
Fifth Grade Who Wants to be a Mathematician

Written by Ryan Mak

Any wrong answer and you will lose any points past the last "safe zone" (after questions 4 and 8). You may use up to two Lifelines by putting "LL" as the answer for a question. There is no credit for the questions with "LL" as an answer but they are not counted as a wrong answer.

Questions 1-4 are worth 1 point each

1. What is the sum of the first two prime numbers, and the number of misspelled words in the first line of the title of this test (Hint: Invitational, Rainier, Mount, and 2004 are all spelled correctly, and the first prime number is 2, not one, but if you add 2+1 you get the second prime number)?
(A) 0 (B) 55 (C) 6 (D) Pizza
2. Reduce the fraction: $\frac{7}{70}$
(A) $\frac{1}{2}$ (B) $\frac{27}{70}$ (C) $\frac{1}{10}$ (D) $\frac{1}{70}$
3. How many integers are there from 1 to 10 including 1 and 10?
(A) 0 (B) 4 (C) 10 (D) 12
4. Jane is color blind, and she has 4 red socks, 18 purses, and 12 blue socks in her sock drawer, how many socks must she pull out of the drawer to make sure she has a pair of socks that are the same color, if she can tell a purse from a sock without looking?
(A) 6 (B) 14 (C) 3 (D) 34

Questions 5-8 are worth 2 points each

5. Frankie, the one armed wonder, can make 5 out of every 9 shots when he plays basketball. If he takes 108 shots, on average how many will he miss?
(A) 5 (B) 60 (C) 55 (D) 48
6. Find the probability that you will draw a 9 from a standard deck of 52 cards and at the same time flip 4 fair coins and get all heads.
(A) $\frac{1}{208}$ (B) $\frac{1}{2}$ (C) $\frac{29}{208}$ (D) $\frac{1}{29}$
7. There was a boxing match between four powerful rival mascots, the Ram, the lancer, the pirate, and the totem. All were very fast at throwing punches, the ram could throw 52 punches per minute, the pirate throws 46 per minute, and the lancer throws 50 per minute. It is not known how fast the totem punches but it is known that after five minutes 935 punches were thrown. How many punches does the totem throw in a minute?
(A) 185 (B) 40 (C) 195 (D) 39

(next page)

2004 Mount Rainier Math Invitational
Fifth Grade Team Pressure Round

Written by Matt Schulz

Reduce all fractions. You must turn in an answer to a problem at 3, 6, 9, 12 and 15 minutes. The first answer turned in is worth 3 points, the second 4 points, ..., and the fifth is worth 7 points.

1. A jing is worth six jangs. A jingle is worth five jangles. A jang is worth one-half of a jangle. If you have 24 jingles, how many whole jings can you exchange for?
2. Andy has \$25. If he spends 25% of it on a book and then 30% of what remains on a magazine, how many 5-cent candies can he now buy?
3. The equation: $y = 3x - 6$ describes a line. When plotted, at what point does it cross the y-axis?
4. Place these numbers in descending order of value: $\pi, 3, 1^3, 0, 2^2$
5. The white buggy is traveling from town A to town B at a speed of 50 mph. The orange buggy is traveling from town B to town A at 500 mph. If the towns are 5500 miles apart, how long will it take for the buggies to meet if they leave at the same time?