



## Rocket City Math League

### Mercury Test

**2006-2007**  
**Round 2**

Answers must be written inside the adjacent answer boxes. All answers must be written in exact, reduced, simplified, and rationalized form. All decimals and mixed numbers must be written as common fractions (unless otherwise specified in the problem). **No calculators, books, or other aids may be used.**

1. In the space academy, there are 12 people on committee AX and 16 people on committee BX. If 5 people serve on both committees, how many people serve on only one committee? (1 point)	
2. Two spheres, A and B are suspended in space and overlap each other. The surface of sphere A passes through the center point of sphere B, and the surface of sphere B passes through the center point of sphere A (as shown in the diagram to the right). If the radius of sphere A is 360, what is the diameter of sphere B? (1 point)	
3. The spaceships <i>Mono</i> and <i>Bio</i> are racing from Pluto to SSX 11, an orbiting asteroid. <i>Mono</i> travels at a rate of 42 mph and <i>Bio</i> travels at a rate of 36 mph. However, Spaceship <i>Mono</i> breaks down $\frac{2}{3}$ of the way to SSX 11. It instantly comes to a complete stop and is delayed for 5 hours. During that time, the crew fixes <i>Mono</i> , and it resumes the race traveling at the original rate of 42 mph. If the distance from Pluto to SSX 11 is 2268 miles, by how many hours does <i>Mono</i> win? (1 point)	
4. Seven aliens are having a party. A lazy alien nicknamed Radar was cutting the Pluckanpten (that planet's equivalent of pizza) into pieces to serve to himself and six of his friends. Because he is so lazy, Radar cuts the Pluckanpten with the least number of straight cuts possible in order to have just enough pieces to serve everyone a piece. How many cuts does Radar make if no one cares about what size piece he/she gets? (1 point)	
5. A classroom in the space academy has 15 rows of desks. Each row has the same number of desks. Because of construction in the classroom, 5 rows of desks need to be removed. Since the classroom still has to seat the same number of students, each remaining row will need 4 more desks. How many desks are in the classroom? (2 points)	
6. There are 10 questions on a true or false test. If Anna guesses randomly on every question, what is the probability that she gets them all correct? (2 points)	
7. Ki is writing a 360 page book! Every 10 pages, starting on page 10, Ki writes the next term from the Fibonacci sequence (1, 1, 2, 3, 5, 8, 13...) on the page. For example, she writes 1 on page 10, 1 on page 20, 2 on page 30, etc. What number will she write on page 140? (2 points)	
8. Three Zorkians are playing a game by themselves. If Ackamatriana scores 10% of the points, Bryzothmana scores 35 points, and Chryzweethma scores twice as many points as Ackamatriana, how many points did Chryzweethma score? (2 points)	
9. Some vile thief has stolen Buzz Lightyear's spaceship. Four of Buzz's suspects— Zurg, Phantom, Effervescence, and the Evil Lord Quackers— were interrogated and the following statements were recorded from each suspect. Zurg said, "Effervescence stole it." Phantom said, "I didn't touch your ship." Effervescence said, "the Evil Lord Quackers is responsible." The Evil Lord Quackers said, "Effervescence lied when he said I stole it." Given that exactly one statement is true, and only one of the villains is responsible, who stole Buzz's ship? (3 points)	
10. Three Kilogians are working on a programming team for a new spaceship. Kilogian number 1 can program the spaceship in 3 earth years, number 2 can program it in 5 earth years, and number 3 can program it in 7 earth years. Working together, how many earth years will it take them to program the ship? (3 points)	
11. In order to enter the password needed to start his spaceship, General Toidi of the Galactic Empire needs to know the sum of $10021221_3$ , $212011_3$ , and $1101221_3$ in base 3. Determine the sum (express your answer in base 3). (3 points)	
12. At an outer space carnival, raffle tickets are numbered by consecutive integers from 162826 through 162878 inclusive. The cost of the raffle ticket is equal to the sum of the digits of the number such that ticket 162829 would cost $1 + 6 + 2 + 8 + 2 + 9 = \$28.00$ . If the raffle tickets were sold in order and a total of \$1114.00 was raised, what is the monetary value of the tickets that remained unsold? (4 points)	

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