

Name \_\_\_\_\_



## Rocket City Math League Mercury Test

**2008-2009  
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 improper fractions. **No calculators, books, or other aides may be used.**

1. There are 3,733 Florps on planet Kree and 2,061 of the Florps on planet Kree are male. How many more male Florps are there on the planet Kree than female Florps? <span style="float: right;"><i>(1 point)</i></span>	
2. In honor of the ex-planet, Pluto, Giffica wants to make a new model of the solar system. He knows that the radius of his old model is 5 km. He also knows that the ratio of the dimensions of his old model to those of Pluto is exactly 1:239. How many kilometers long would he have to make the radius of his new model of Pluto if he wants it to have a scale of 1:59.75? <span style="float: right;"><i>(1 point)</i></span>	
3. Aethic is taking a trip to the intergalactic market and must deal with many different units of currency. If 14 Grubnors equals 9 Zigzogs, and 5 Zigzogs equals 10 Miks, how many Grubnors does Aethic have to spend to buy something that costs 45 Miks? <span style="float: right;"><i>(1 point)</i></span>	
4. Yesterday there were 1,672 female Florpordeans on the planet Eerk. Today, all of them had three children, exactly half of whom were female. How many female Florpordeans are on the planet Eerk, after all of the children have been born? <span style="float: right;"><i>(1 point)</i></span>	
5. Ernie's rocket goes 14.5 turbo miles per hour for 4 hours. Jenn's rocket goes 18 turbo miles per hour for 3 hours. What is the average speed of the two rockets, in turbo miles per hour? <span style="float: right;"><i>(2 points)</i></span>	
6. Francis is traveling to the country Slorp from his home in the country of Oogeldorf. He travels 21 miles east at 3 mph and 72 miles north at 9 mph. How far is Francis from his home at this instant, in miles? <span style="float: right;"><i>(2 points)</i></span>	
7. There are two ships in a two dimensional universe at the coordinates $(x, -6)$ , and $(-13, y)$ . The coordinates for the point exactly halfway between the ships is $(-4, \frac{1}{2})$ . What is $x+y$ ? <span style="float: right;"><i>(2 points)</i></span>	
8. Yrucrem thinks the space expression $x^3+y^2+x$ has a greater power than the space expression, $x^2+y+3$ . What is the power of the expression with the larger power? <span style="float: right;"><i>(2 points)</i></span>	
9. The mathematically inept alien, Brinik, needs to completely simplify the expression $2a^3+[a^2+3a(a+a^2)]^2$ to unlock his space-car. The code that unlocks his car is the sum of the coefficients of the completely simplified expression. What is the code that Brinik must use to unlock his space-car? <span style="float: right;"><i>(3 points)</i></span>	
10. Simplify $(X^4Z^{-3}/Y^2)^{-2}$ with positive exponents. <span style="float: right;"><i>(3 points)</i></span>	
11 Ratatungy needs to find the last numbers in this sequence, 3, 4, 2, 5, 1, 6, 0, 7, a, b, c, in order to simplify the following expression and save his friend Prashy. What is $(a+b)^2+4c$ ? <span style="float: right;"><i>(3 points)</i></span>	
12. Find the coordinates of the x-intercepts, in the Cartesian plane, of the graph of $y=x^2+4x-7$ . <span style="float: right;"><i>(4 points)</i></span>	

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