

2012 Rocket City Junior Math Mania
Individual Test – 8th Grade

1. Evaluate: $345 + 974$
2. What is the volume, in cubic inches, of a cube with edges measuring $5\sqrt{2}$ in?
3. Express the base 4 number 321_4 as a base two number.
4. A triangle has sides measuring 8 m, 5 m, and 5 m. What is the length of the altitude to the longest side?
5. What is the next term of the sequence 10, 22, 15, 25, 20, 28, 25, 31, 30, 34, 35, ___?
6. Evaluate: $-13 - (-3) \times (-5)$
7. A circle is inscribed inside a square with an area of 64 m^2 . What is the area of the circle, in square meters? (Leave your answer in terms of π .)
8. At Will's birthday party, there were fifteen people. Eight people wanted olives on their pizza, while eleven wanted mushrooms on their pizza. If two people wanted neither topping, how many people wanted both?
9. The vertices of a regular 22-gon are lettered from A to V in clockwise order. If a line passes through vertex E and the center of the 22-gon, what other vertex does it pass through?
10. How many positive three-digit integers are even?
11. Evaluate: $(6 \times 5^2 - 4 \times 3) \div 2$
12. A right triangle has legs measuring 7 cm and 24 cm. What is the length, in centimeters, of the hypotenuse?
13. If my piggy bank contains only dimes, nickels and pennies, and has nineteen coins worth a total of 48 cents, how many pennies are in the piggy bank?
14. Evaluate: $180 - 58$
15. What is the measure, in degrees, of an interior angle of a regular hexagon?
16. In which quadrant (I, II, III, or IV) does the point (3, -7) lie?
17. How many positive integers are factors of 72?
18. If $b(c) = 3c - 4$ and $d(f) = 2f + 1$, evaluate $b(d(5))$.
19. A barn contains humans and horses. If there are a total of 16 heads and 60 feet, how many horses are in the barn?

20. When a single card is drawn from a standard 52-card deck, what is the probability that the card shows a red or a 6?
21. Simplify by rationalizing the denominator: $\frac{14}{3+\sqrt{2}}$
22. When the magic number is increased by 32 and this result is tripled, the final result is 264. What is the magic number?
23. What is the sum of the positive even numbers less than 50?
24. Six Oompa-Loompas can make ten batches of chocolates in four days. How many days would it take eight Oompa-Loompas to make thirty batches of chocolates?
25. What is the thirteenth term of an arithmetic sequence with first term 11 and third term 19?
26. What are the coordinates, in the form (x, y) , of the intersection of the lines $y = 2x + 3$ and $2x + 3y = 33$.
27. What are the coordinates, in the form (x, y) , of the vertex of the parabola $y = 3x^2 + 18x - 5$?
28. What value(s) of b satisfy $2b^2 - 5b - 3 = 0$?
29. What is the median of the data set $\{3, 9, 1, 2, 15, 6, 7, 4, 2, 11, 2, 19, 15\}$?
30. What is the area, in square meters, of a right triangle with legs measuring 4 m and 9 m?