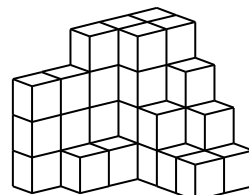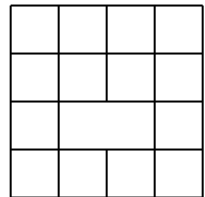# 2008 Rocket City Junior Math Mania
Individual Test – 5th Grade

1. What is the sum of 1.23 and 45.6, expressed as a decimal?

2. If the sum of two numbers is 247 and one is 111 less than the other, what is the value of the smaller number?

3. What is the largest prime number less than 100?

4. An isosceles triangle has two sides measuring 18 and 39 cm. What is the length, in centimeters, of its third side?

5. What is the mode of the data set $\{1,1,1,1,2,2,3,3,3,4,5,5,5,6,6,94\}$?

6. Express 78.9012 in scientific notation.

7. If six Turnips can be exchanged for either five Umbrellas or four Violins, how many Violins would be equivalent to 200 Umbrellas?

8. What value(s) of n satisfy $2n - 9 = 4n + 53$?

9. How many diagonals can be drawn in a convex octagon?

10. What is the sum of the counting numbers from 1 to 99 inclusive?

11. Evaluate: 3^5

12. At the Dude Ranch, a corral contains cowpokes (people) and horses. If there are a total of 84 heads and 312 feet, how many cowpokes are in the corral?

13. What is the distance between the points (5, 9) and $(5,3)$?

14. How many squares of any size can be found in the grid of unit squares shown missing one segment?

15. A right triangle has a hypotenuse measuring 16 cm and a leg measuring 12 cm. What is the length, in centimeters, of the other leg?

16. What is the sum of the number of months in a year, the number of sides on a heptagon, and the number of faces on a cube?

17. If Abigail is currently five times as old as Vivian, and in nine years she will only be twice as old as Vivian, how old is Abigail now?

18. How many unit cubes were used to build the stack shown?

19. Evaluate: $34^2 - 23^2$

20. What is the surface area, in square centimeters, of a cube with edges measuring 4 cm?

21. 32 is what percent of 20?

22. When the digits of a positive two-digit integer are reversed, the new positive two-digit integer is 27 less than the original. What is the smallest possible value of the original number?

23. A triangle with sides measuring 5, 6, and 8 cm is similar to a triangle with sides measuring 3, 4, and x cm. What is the value of x?

24. When two fair, six-sided dice are rolled, what is the probability that the sum of the numbers shown is eleven?

25. What is the volume, in cubic centimeters, of a right circular cone with a base radius of 5 cm and a height of 6 cm?

26. Two concentric circles have radii of 8 and 12 cm. What is the area of the region outside the smaller circle and inside the larger? (Leave your answer in terms of pi.)

27. What is the sum of the positive integer factors of 48?

28. What is the equation, in slope-intercept form $(y = mx + b)$, of the line through the point $(-2, -6)$ and perpendicular to the line $3x + 6y = 2$?

29. What is the fifth term of an arithmetic sequence with a first term of 14 and a common difference of 9?

30. When Ella, Fred, Greg, and Hannah stand in line, Hannah is not first, Greg is directly ahead of Fred, and Ella is somewhere behind Hannah. Write the first letters of the people in line from front to back (e.g. EFGH) as your answer.