

2013 Rocket City Junior Math Mania
Algebra and Probability Test – 6th Grade

1. What is the median of the data set {9, 1, 2, 8, 6, 2, 4, 2, 3}?
 2. 341 pencils are to be put in boxes that hold twelve pencils each. After as many boxes have been filled as possible, how many pencils will be left over?
 3. When two dice are rolled, what is the probability that the numbers shown have a sum of ten?
 4. Ysabel can make four paper airplanes in six minutes, and Xavier can make three paper airplanes in ten minutes. Altogether, how many paper airplanes can they make in an hour?
 5. Write the letters A, B, C, and D in order from smallest to largest.
 $A = 483 + 1722$ $B = 3598 - 1954$
 $C = 35 \times 48$ $D = 12345 \div 3$
 6. A bag contains three blue and nine white marbles. If two marbles are randomly drawn without replacement, what is the probability that the first marble is blue and the second is white?
 7. Evaluate: $(-5)(-4) - (-3) - 2$
 8. Evaluate: $\frac{4! \times 4^4}{4^2 \times 3!}$
 9. When the secret number is tripled and this result is decreased by 45, the final result is 168. What is the secret number?
 10. In Mr. McHugh's class of twenty-five students, eighteen students like math and fourteen students like reading. If one student likes neither math nor reading, how many students like both math and reading?
 11. What number is 60% of $\frac{2}{3}$ of $5\frac{1}{6}$? Express your answer as a fraction.
 12. In the array of unit squares to the right, how many different paths of length 8 are there (along the segments) from the upper left corner to the lower right corner?

 13. I have seventeen coins worth a total of \$1.34. If each coin is either a penny, dime, or quarter, what is the smallest number of dimes I could have?
 14. Evaluate: 49×853
 15. If twice my number (an integer) is greater than 30, three times my number is less than 70, and five times my number is greater than 70, how many different integers could I be thinking of?
 16. Find the value of x that satisfies the equation: $\frac{1}{3} = \frac{x-4}{2x-4}$.
 17. The probability that I go to a restaurant for lunch is $\frac{1}{2}$. If I go, the probability of eating soup is $\frac{2}{3}$. What is the probability of going to the restaurant and eating soup?
 18. The probability that Omar wins a particular game is $\frac{1}{3}$. If the probability that he ties is $\frac{1}{4}$, what is the probability that Omar will lose the game?
 19. Eight students are going to compete in the Solve-O-Rama, but there are only three trophies: first-, second-, and third-place. In how many ways might these trophies be awarded?
 20. In how many distinguishable ways can the letters in the word "DEER" be arranged?
- TB1 .The digits of a positive two-digit integer are reversed to produce another positive two-digit integer. If the new number is 27 less than the original number, what is the largest possible value of the original number?

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Geometry and Potpourri Test – 6th Grade

1. What is the area, in square meters, of a right triangle with legs measuring 14 m and 17 m?
2. What is the least common multiple of 36 and 60?
3. What is the area, in square meters, of a rectangle with a perimeter of 32 m and a length of 9 m?
4. Two angles of a triangle are 42° and 117° . What is the measure of the third angle (in degrees)?
5. What is the sum of the positive integers that are factors of 24?
6. How many positive three-digit integers less than 450 are palindromes? (A palindrome is a number that is the same when the order of the digits is reversed.)
7. In a “cryptarithm”, an arithmetic problem is written using letters. Every “1” is changed to a certain letter, then every “2” is changed to a different letter, etc, until the entire problem is made up of letters. For example, the problem $7 + 70 = 77$ might be written $Z + ZY = ZZ$. What is the smallest possible value of the sum in the cryptarithm shown?

ABC
$+ CA$
$\hline CDB$
8. In a four-unit apartment building, Amy, Bella, Ciara, and Delia live in units 1, 2, 3, and 4, but not necessarily in that order. In addition, each of them owns one pet; there is a Zebra, a Yeti, a Xenops, and a Walrus. Neither Amy nor the Zebra lives in unit 1, the Yeti lives in unit 2, Ciara owns the Xenops, and Delia lives in unit 4. If Bella doesn’t live in Unit 2, the Walrus doesn’t live in unit 4, and Ciara doesn’t live in unit 3, what person and pet live in Unit 3?
9. The perimeter of a parallelogram is 76 meters. If one side is 14m, what is the length (in meters) of the other side?
10. What is the sum of the positive odd numbers less than 16?
11. Write the prime factorization of 2013.
12. How many four-digit numbers between 3729 and 5081 have four different digits that add up to 11?
13. What is the circumference, in meters, of a circle with a radius of 23 m? Use 3.14 for π (Pi). Round your answer to the nearest tenth.
14. How many rectangles of any size and orientation are there in the three-by-five array of unit squares shown to the right?

15. The area of a rectangle is 96 square meters. If the length and width are both integers, what is the smallest possible value of the perimeter (in meters)?
16. How many positive integers are factors of 54?
17. What is the seventh term of a geometric sequence with first term 6 and common ratio 3? (The sequence begins with: 6, 18, 54, ...)
18. Six stars must be placed on the following grid in order to satisfy the following conditions: (1)each row and each column contains a star, (2)a star must be in each outlined (bold) region, and (3) stars may not be in two boxes that touch, even if they touch only at a single point. Which of the following boxes (A, B, C, or D) will have a star in it?

19. What is the missing term of the sequence 2, 3, 6, 11, 18, 27, ____, 51, ...?
20. What is the sum of the integers between 17 and 30 inclusive (including 17 and 30)?

TB1. If Elton throws a dart at the 9 X 9 square dartboard, what is the probability of the dart landing in the shaded region?

