1. _____ If $11\times n = 123{,}456{,}787{,}654{,}321$, what is the value of n?

2. (,) The point $(4, -2)$ is reflected over the line $y = x$. What are the coordinates of its image? Express your answer as an ordered pair.

3. _____  The ages, in years, of four members of a family are represented by a, b, c and d, where $a < b < c < d$. Their mean age is 34, their median age is 33, and the range of their ages is 32. What is the value of a?

4. _____ base 7 What is the value of $32_4 + 43_5 + 54_6$ when written in base 7?

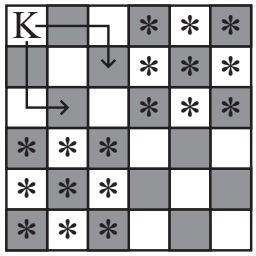
5. _____ Raquel uses six different digits to fill in the blanks below, writing one digit in each blank, so that the resulting addition statement is correct. What is the least possible sum of the six digits?

$$\_\_\ \_\_ + \_\_\ \_\_ = \_\_\ \_\_$$

6. _____ If a, b and c satisfy the equations $a^2 + b^2 = 313$, $b^2 + c^2 = 277$ and $a^2 + c^2 = 302$, what is the value of $a^2 + b^2 - c^2$?

7. _____ moves

A chess knight makes L-shaped moves on a grid of squares. During each move, the knight moves two squares either up, down, left, or right, then one square in a perpendicular direction. The knight starts on the square marked K in the 6-by-6 board shown here, and its two possible first moves are shown. What is the least number of moves the knight must make from the K in order to land at least once on each of the squares marked with a star?

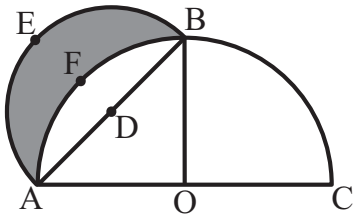


8. _____

A chess club has 8 girls and 6 boys. Two members, Zig and Zag, are fraternal twins of different genders. If a team of 3 girls and 3 boys is randomly selected for the district championship, what is the probability that exactly one of the twins is on the team? Express your answer as a common fraction.

9. _____ units^2

Triangle ABO is an isosceles right triangle, AC is a diameter of circle O, and AB is a diameter of circle D. If the semicircle centered at O has area 2π, what is the shaded area AEBF (which is called a *lune*)?



10. _____

Each cell in the 3-by-3 array of squares shown is filled with a digit from 1 to 9, inclusive. If the four listed conditions are satisfied, what is the resulting three-digit number when diagonal B is read from upper-left to lower-right?

(1) Each digit from 1 through 9 is used exactly once.

(2) Each row, read from left to right, forms an odd three-digit multiple of 3 that is not a multiple of 9.

(3) Each column, read from top to bottom, forms an odd three-digit multiple of 3 that is not a multiple of 9.

(4) Diagonal A, read from lower-left to upper-right, forms an odd three-digit multiple of 9.