Challenge 4

1. _____ How many six-digit whole numbers have a digit sum greater than 52?

2. _____ The right edge of the paper shown is folded over so that it meets the left edge. The top edge is then folded down to meet the bottom. The top of the folded sheet is then folded down once more so that all eight numbers are stacked atop one another. What is the sum of the second number from the top of the stack and the second number from the bottom?

1	2
3	4
5	6
7	8

3. _____ cm The area of rectangle ABCD is 5cm^2. The length of diagonal AC is $\sqrt{15}$cm. What is the perimeter of rectangle ABCD?

4. _____ What two-digit prime is decreased by 54 when its digits are reversed?

5. _____ mi

It takes 3 hours to fly from Raleigh to Orlando with a 20mph tailwind. Flying into the same 20mph headwind, the trip from Orlando to Raleigh takes 4 hours. What is the distance in miles between Raleigh and Orlando?

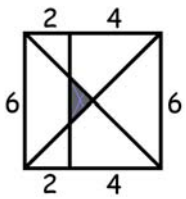
6. _____ cm What is the length of the median to one of the congruent sides of an isosceles triangle whose side lengths are 2cm and 4cm? Express your answer in simplest radical form.

7. _____ The ratio of crows to sparrows sitting on a fence is 5:12. After a crow and a sparrow fly away, the ratio of crows to sparrows is 2:5. If two more crows and two more sparrows fly away, what will be the ratio of crows to sparrows on the fence? Express your answer as a common fraction in simplest form.

8. _____ A wooden cube is painted red on all six faces and then cut into eight congruent cubes. The cubes are then randomly reassembled to form a new cube. The cube is painted blue on all six faces and then disassembled again. If one of the eight smaller cubes is selected at random and rolled, what is the probability that the face that lands up will be red? Express your answer as a common fraction.

9. _____ The product of the factors of 720 can be expressed: $2^a \cdot 3^b \cdot 5^c$. Find a + b + c.

10. _____ How many square units are in the area of the shaded region of the square below?



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