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1994 Q21

21. A gumball machine contains 9 red, 7 white, and 8 blue gumballs. The least number of gumballs a person must buy to be *sure* of getting four gumballs of the same color is

(A) 8 **(B)** 9 **(C)** 10 **(D)** 12 **(E)** 18

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1996 Q21

21. How many subsets containing three different numbers can be selected from the set

$$\{89, 95, 99, 132, 166, 173\}$$

so that the sum of the three numbers is even?

(A) 6 **(B)** 8 **(C)** 10 **(D)** 12 **(E)** 24

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2013 Q21

21. Samantha lives 2 blocks west and 1 block south of the southwest corner of City Park. Her school is 2 blocks east and 2 blocks north of the northeast corner of City Park. On school days she bikes on streets to the southwest corner of City Park, then takes a diagonal path through the park to the northeast corner of City Park, and then bikes on streets to school. If her route is as short as possible, how many different routes can she take?

(A) 3 **(B)** 6 **(C)** 9 **(D)** 12 **(E)** 18

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1985 Q22

22. Assume every 7-digit whole number is a possible telephone number except those which begin with 0 or 1. What fraction of telephone numbers begin with 9 and end with 0?

A) $\frac{1}{63}$ B) $\frac{1}{80}$ C) $\frac{1}{81}$ D) $\frac{1}{90}$ E) $\frac{1}{100}$

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1989 Q22

22. The letters A,J,H,S,M,E and the digits 1,9,8,9 are "cycled" separately as follows and put in a numbered list:

AJHSME 1989

1. JHSMEA 9891
2. HSMEAJ 8919
3. SMEAJH 9198

.....

What is the number of the line on which AJHSME 1989 will appear for the first time?

A) 6 B) 10 C) 12 D) 18 E) 24

6 / 8

1993 Q22

22. Pat Peano has plenty of 0's, 1's, 3's, 4's, 5's, 6's, 7's, 8's and 9's, but he has only twenty-two 2's. How far can he number the pages of his scrapbook with these digits?

(A) 22 **(B)** 99 **(C)** 112 **(D)** 119 **(E)** 199

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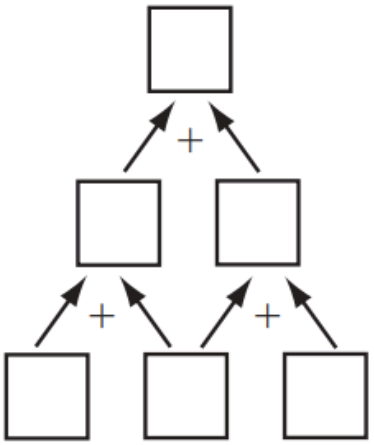
2006 Q22

22. Three different one-digit positive integers are placed in the bottom row of cells. Numbers in adjacent cells are added and the sum is placed in the cell above them. In the second row, continue the same process to obtain a number in the top cell. What is the difference between the largest and smallest numbers possible in the top cell?



(A) 16 **(B)** 24 **(C)** 25 **(D)** 26 **(E)** 35

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2009 Q22

22. How many whole numbers between 1 and 1000 do **not** contain the digit 1?

(A) 512 **(B)** 648 **(C)** 720 **(D)** 728 **(E)** 800