

2014-11-03

**Shahriari 8.1.1** [20]

A coffee company was willing to pay \$1 for each person interviewed about his or her likes and dislikes on types of coffee. Of the persons interviewed, 270 liked ground coffee, 200 liked instant coffee, 70 liked both, and 50 did not like either choice. What is the total amount of money the company had to pay?

**Shahriari 8.1.3** [20]

An advertising agency finds that of its 170 clients, 115 use television, 100 use radio, 130 use magazines, 75 use television and radio, 95 use radio and magazines, 85 use television and magazines and 70 use all three. How many clients use only magazines? How many clients use none of these media?

**Shahriari 8.1.4** [20]

How many integers between 1 and 10,000 are neither perfect squares nor perfect cubes.

**Shahriari 8.1.6** [20]

How many permutations of the letters **SCRIPPS** have no two consecutive letters the same?

**Shahriari 8.1.8** [20]

Lewis Carroll speaks of a battle among 100 combatants in which 80 lost an arm, 85 a leg, 70 an eye and 75 an ear. Some number  $p$  of people lost all four. Find the lower and upper bound for  $p$ .

**Shahriari 8.1.10** [20]

How many five-card hands contain a jack, a queen and king?

**Shahriari 8.1.14** [20]

How many permutations of the 26 letters are there that contain none of the sequences MATH, RUNS, FROM or JOE?

**Shahriari 8.1.15** [20]

Find the number of primes less than 100 without actually finding all the primes

**Shahriari 8.2.1** [20]

Determine the number of 10-combinations of the multiset

$$S = \{\infty \cdot a, 3 \cdot b, 5 \cdot c, 7 \cdot d\}$$

**Shahriari 8.2.3 [20]**

A bakery sells seven kinds of doughnuts. How many ways are there to choose one dozen donuts if no more than three donughts of any kind are used?

**Shahriari 8.3.10 [20]**

Fereydoon, Faranak, Roudabeh, Tahminen and Rostem are students in the class. Each is to be assigned a differnt dialogue form the following list: Crito, Euthyphro, Protagoras, Meno, Parmenides. Fereydoon is not interested in the Crito or the Protagoras; Faranak is not interested in the Meno; Roudabeh is not interested in the Euthyphro or the Parmenides; Tahmineh is not interested in the Euthyphro and Rostam is not interested in the Crito or the Protagoras. In how many ways can we assign the five dialogues to the five students given the above constraints?

**Shahriari 8.X.1 [20]**

Twelve citizens vote for two candidates in a college election. It happens that the vote is tied 6 to 6. However, for dramatic effect, the ballots are shuffled and read out one at a time and the cumulative score announced. What is the probability that at some point there is a gap of 3 votes between the two candidates? Is it closer to 47% or 48%?