

COMBINATIONS

- 2013A 11. A student council must select a two-person welcoming committee and a three-person planning committee from among its members. There are exactly 10 ways to select a two-person team for the welcoming committee. It is possible for students to serve on both committees. In how many different ways can a three-person planning committee be selected?
- (A) 10 (B) 12 (C) 15 (D) 18 (E) 25
- 2011B 11. There are 52 people in a room. What is the largest value of n such that the statement "At least n people in this room have birthdays falling in the same month" is always true?
- (A) 2 (B) 3 (C) 4 (D) 5 (E) 12

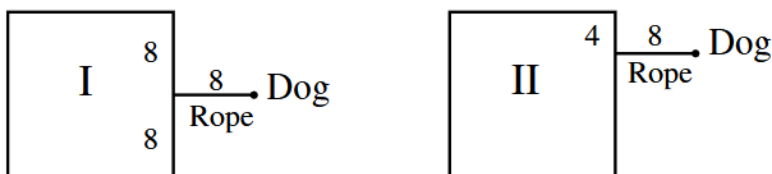
2012B

11. A dessert chef prepares the dessert for every day of a week starting with Sunday. The dessert each day is either cake, pie, ice cream, or pudding. The same dessert may not be served two days in a row. There must be cake on Friday because of a birthday. How many different dessert menus for the week are possible?

(A) 729 (B) 972 (C) 1024 (D) 2187 (E) 2304

2006A

12. Rolly wishes to secure his dog with an 8-foot rope to a square shed that is 16 feet on each side. His preliminary drawings are shown.



Which of these arrangements gives the dog the greater area to roam, and by how many square feet?

(A) I, by 8π (B) I, by 6π (C) II, by 4π (D) II, by 8π (E) II, by 10π

2004A

12. Henry's Hamburger Heaven offers its hamburgers with the following condiments: ketchup, mustard, mayonnaise, tomato, lettuce, pickles, cheese, and onions. A customer can choose one, two, or three meat patties, and any collection of condiments. How many different kinds of hamburgers can be ordered?

(A) 24 (B) 256 (C) 768 (D) 40,320 (E) 120,960

- 2007A 12. Two tour guides are leading six tourists. The guides decide to split up. Each tourist must choose one of the guides, but with the stipulation that each guide must take at least one tourist. How many different groupings of guides and tourists are possible?
- (A) 56 (B) 58 (C) 60 (D) 62 (E) 64
- 2004A 13. At a party, each man danced with exactly three women and each woman danced with exactly two men. Twelve men attended the party. How many women attended the party?
- (A) 8 (B) 12 (C) 16 (D) 18 (E) 24
- 2011A 13. How many even integers are there between 200 and 700 whose digits are all different and come from the set $\{1, 2, 5, 7, 8, 9\}$?
- (A) 12 (B) 20 (C) 72 (D) 120 (E) 200

- 2018B 13. How many of the first 2018 numbers in the sequence 101, 1001, 10001, 100001, ... are divisible by 101?
- (A) 253 (B) 504 (C) 505 (D) 506 (E) 1009
- 2016A 14. How many ways are there to write 2016 as the sum of twos and threes, ignoring order? (For example, $1008 \cdot 2 + 0 \cdot 3$ and $402 \cdot 2 + 404 \cdot 3$ are two such ways.)
- (A) 236 (B) 336 (C) 337 (D) 403 (E) 672
- 2002A 15. The digits 1, 2, 3, 4, 5, 6, 7, and 9 are used to form four two-digit prime numbers, with each digit used exactly once. What is the sum of these four primes?
- (A) 150 (B) 160 (C) 170 (D) 180 (E) 190

- 2003B 15. There are 100 players in a singles tennis tournament. The tournament is single elimination, meaning that a player who loses a match is eliminated. In the first round, the strongest 28 players are given a bye, and the remaining 72 players are paired off to play. After each round, the remaining players play in the next round. The match continues until only one player remains unbeaten. The total number of matches played is
- (A) a prime number (B) divisible by 2 (C) divisible by 5
(D) divisible by 7 (E) divisible by 11
- 2012B 15. In a round-robin tournament with 6 teams, each team plays one game against each other team, and each game results in one team winning and one team losing. At the end of the tournament, the teams are ranked by the number of games won. What is the maximum number of teams that could be tied for the most wins at the end of the tournament?
- (A) 2 (B) 3 (C) 4 (D) 5 (E) 6