1. Let S be the set of all outcomes when two dice (one red; one green) are cast. Let E be the subset of outcomes in which both dice are odd, and let F be the subset of outcomes in which both dice are even. How many elements are there in the following sets?

(a) $E \cap F$ [0] [Check]
(b) $E' \cap F$ [9] [Check]

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2. In clinical trials of the latest suntan lotion, Delta Sun Promoter, 100 test subjects experienced third degree burns or nausea (or both). Of these, a total of 35 people experienced third degree burns, and 25 experienced both third degree burns and nausea. How many subjects experienced nausea?

[90] subjects

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3. According to a New York Times report[†] on the 16 top-performing restaurant chains, 11 serve breakfast, 11 serve beer, and 10 have full table service. All 16 offered at least one of these services. A total of 5 were classified as "family chains," meaning that they serve breakfast, but do not serve alcohol. Further a total of five serve breakfast and have full table service, while none serve breakfast, beer, and also have full table service.

(a) How many serve beer and breakfast? [6]
(b) How many serve beer but not breakfast? [5]
(c) How many serve breakfast, but neither have full table service, nor serve beer? [0]
**(d)** How many serve beer and have full table service? [5]

† Source: *The New York Times,* June 22, 1996, p. 33.

4. In how many ways can the following elimination playoff schedule be completed?

Oklahoma State U

U of Tennessee

Eastern Kentucky U

University of Arkansas
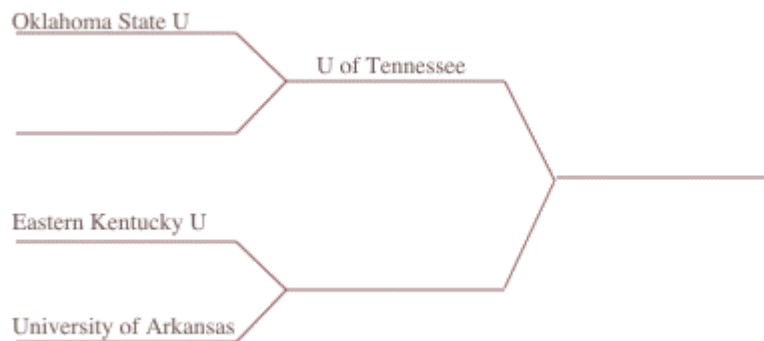
4   possible ways

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5. How many ways are there of filling in the following part of the Greek Week Mortal Combat Playoff Competition in which a total of 12 fraternities participate?

DSP

Kappa Sig

SAM

SAM
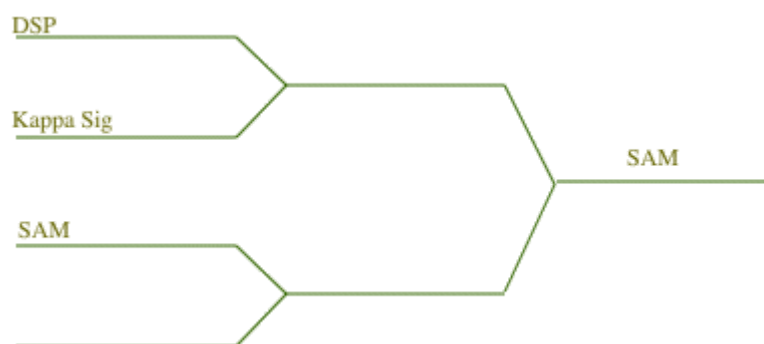
18   possible ways

6. While selecting candy for students in his class, Stefan must choose between gummy candy and licorice nibs. Gummy candy packets come in three sizes, while packets of licorice nibs come in two. If he chooses gummy candy, he must select either gummy bears, gummy worms, or gummy dinos. If he chooses licorice nibs, he must choose between red and black. How many choices does he have?

13   possible choices

7. You are planning to purchase a new computer with spreadsheet and word processing software and an Internet browser. There are three hardware platforms to choose from: a *Macintosh*-compatible platform, an *IBM*-compatible platform, and a and a Unix platform. You are unsure whether to use *Lotus* or *Excel* as your spreadsheet software, and whether to install *Netscape* or *Internet Explorer* as your Internet browser. As for word processing, the *Macintosh* platform includes a free copy of *Macwrite Pro*, so you don't need one, while you must choose between *Word Perfect* and *Microsoft Word* in the event that you choose one of the other two platforms. Given these choices, how many possible computer configurations are possible?

20   possible configurations

8. A packet of distinctly shaped gummy candy contains 4 strawberry gums, 4 lime gums, 2 blackcurrant gums, and 2 orange gums. Harry Savvy sticks his hand in and selects 4 at random.

(a) How many possible collections of 4 gums can he pull out?

| 495 | possible sets | | C(12,4) = 495 |

(b) Harry is fond of combinations of two strawberry and two blackcurrant gums (he feels that the flavors complement each other nicely). How many collections will make Harry happy?

| 6 | sets | | C(4,2) C(2,2) = (6)(1) = 6 |

(c) What is the probability that Harry will be happy? (Enter an exact fraction; not a decimal approximation.)

Probability = 6/495

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9. The Delta Secret Philosophy society has just recruited three football players, two nerds, and three computer geeks. Big Nico picks four of these new members at random for the philosophical discussion team .

(a) How many different sets of four new members are possible?

| 70 | possible sets | | C(8,4) = 70 |

(b) How many of those sets of 4 contain both nerds and two computer geeks?

| 3 | sets | | C(2,2) C(3,2) = (1)(2) = 3 |

(c) What is the probability that Nico just happens to select both nerds and two computer geeks? (Enter an exact fraction; not a decimal approximation.)

Probability = 3/70