

Probability Quiz

Suppose Ann, Betty and Carl are soccer players, and that Dave, Ed, Frank & Ginger are basketball players.

- 1) You want to take 3 of the above jocks on a trip with you. What is the probability that you'll pick...
 - a. ... 3 girls?
 - b. ... 2 girls?
 - c. ... at least 2 girls?
 - d. ... only male basketball players
- 2) If you pick a random jock, what is the probability that you'll pick...
 - a. ... a male basketball player?
 - b. ... a girl or a basketball player?

Solutions

- 1) You are choosing 3 people out of 7 people, and there are ${}^7C_3 = 35$ ways to do this (denominator = 35).

$$\begin{aligned} \text{a. } P(3 \text{ girls}) &= P(3 \text{ girls and } 0 \text{ boys}) = \frac{{}^3C_3({}^4C_0)}{{}^7C_3} = \frac{(1)(1)}{35} = \frac{1}{35} \\ \text{b. } P(2 \text{ girls}) &= P(2 \text{ girls and } 1 \text{ boy}) = \frac{{}^3C_2({}^4C_1)}{{}^7C_3} = \frac{(3)(4)}{35} = \frac{12}{35} \\ \text{c. } P(2 \text{ girls OR } 3 \text{ girls}) &= P(2 \text{ girls}) + P(3 \text{ girls}) = \frac{{}^3C_2({}^4C_0)}{{}^7C_3} + \frac{{}^3C_3({}^4C_1)}{{}^7C_3} = \frac{1}{35} + \frac{12}{35} = \frac{13}{35} \\ \text{d. } P(3 \text{ male basketball players}) &= \frac{{}^3C_3({}^4C_0)}{{}^7C_3} = \frac{1}{35} \end{aligned}$$

- 2) You are choosing 1 person out of 7 people, and there are ${}^7C_1 = 7$ ways to do this (denominator = 7).

$$\begin{aligned} \text{a. } P(\text{male AND basketball player}) &= \frac{{}^3C_1}{{}^7C_1} = \frac{3}{7} \\ \text{b. } P(\text{female OR basketball player}) &= \frac{{}^3C_1}{{}^7C_1} + \frac{{}^4C_1}{{}^7C_1} - \frac{{}^1C_1}{{}^7C_1} = \frac{3}{7} + \frac{4}{7} - \frac{1}{7} = \frac{6}{7} \end{aligned}$$