

Math 1160 – Section 6.4 Answer Key

8. Sample Space = 11 balls → 6 White and 5 Red
 Sample Size = 4 balls selected at random
 Event = 2 white balls and 2 red balls

$$\frac{C(6,2) \times C(5,2)}{C(11,4)} = \frac{15 \times 10}{330} = \frac{150}{330} = \frac{5}{11}$$

11. This is set up the same as the numbered marble problem.
 Sample Space = 22 children → 12 boys and 10 girls
 Sample Size = 7 children
 Event = At least 2 girls are chosen

2G5B or 3G4B or 4G3B or 5G2B or 6G1B or 7G0B

$$\frac{C(10,2) \times C(12,5) + C(10,3) \times C(12,4) + C(10,4) \times C(12,3) + C(10,5) \times C(12,2) + C(10,6) \times C(12,1) + (10,7) \times C(12,0)}{C(22,7)}$$

$$\frac{(45 \times 792) + (120 \times 495) + (210 \times 220) + (252 \times 66) + (210 \times 12) + (120 \times 1)}{C(22,7)}$$

$$\frac{35640 + 59400 + 46200 + 16632 + 2520 + 120}{170544} = \frac{160512}{170544} = \frac{16}{17}$$

12. This is set up the same as the numbered marble problem.
 Sample Space = 22 children → 12 boys and 10 girls
 Sample Size = 7 children
 Event = More boys than girls are chosen

4B3G or 5B2G or 6B1G or 7B0G

$$\frac{C(12,4) \times C(10,3) + C(12,5) \times C(10,2) + C(12,6) \times C(10,1) + C(12,7) \times C(10,0)}{C(22,7)}$$

$$\frac{(495 \times 120) + (792 \times 45) + (924 \times 10) + (792 \times 1)}{C(22,7)}$$

$$\frac{59400 + 35640 + 9240 + 792}{170544} = \frac{105072}{170544} = \frac{199}{323}$$

13. This is set up the same as the numbered marble problem.

Sample Space = 22 children → 12 boys and 10 girls

Sample Size = 7 children

Event = No boys are chosen (so 7 girls are chosen)

7G0B

$$\frac{C(10,7) \times C(12,0)}{C(22,7)} = \frac{120}{170544} = \frac{\underline{5}}{\underline{7106}}$$

$$20. \frac{C(7,4)}{2^7} = \frac{\underline{35}}{\underline{128}} = .2734$$

**Once you find the number of combinations of 4 heads (sequence of 4 positions), you do not need to calculate the number of combinations of 3 tails, because the sequence is already determined (the remaining 3 positions).

22. **.68 or 68%**

**Remember the sum of all the probabilities must equal 1. Draw the Venn Diagram and note the probability of each basic region.

24. This is set up as the numbered marble problem.

Sample Space = 15 member of Senate committee → 10 vote “yes”, 5 vote “no”

Sample Size = 6 committee members

Event = 4 vote “yes” and 2 vote “no”

Choose how many people you need on the committee out of how many people you have to choose from.

4Y2N

$$\frac{C(10,4) \times C(5,2)}{C(15,6)} = \frac{(210 \times 10)}{5005} = \frac{2100}{5005} = \frac{\underline{60}}{\underline{143}}$$

28. This is set up like a coin tossing problem.

3Girls or 4Girls

$$\frac{C(4,3) + C(4,4)}{2^4} = \frac{4 + 1}{16} = \frac{\underline{5}}{\underline{16}}$$