

Math 1324
Chapter 7
Review

1. A pair of distinguishable dice is rolled. Find the probability that the sum showing is 7.
2. One card is drawn from an ordinary 52-card deck of playing cards. Find the probability that the card drawn is a red card or a queen.
3. One card is drawn from an ordinary 52-card deck of playing cards. Find the probability that the card drawn is a red card and a queen.
4. A box contains 9 red balls numbered 1 – 9 and 6 white balls numbered 10 – 15. If a ball is drawn at random from the box, find the probability that it is red or the number on it is divisible by 3.
5. Suppose a county has 30,000 registered voters, 15,000 of whom are Democrats and 12,500 of whom are Republicans. Find the probability that a registered voter selected at random from this county is neither Democrat nor a Republican.
6. If $P(E) = \frac{1}{6}$, what are the odds that
 - a. E will occur?
 - b. E will not occur?
7. If the odds against E occurring are 2:7, what is the probability that E will occur?
8. A box contains 9 red balls numbered 1 – 9 and 6 white balls numbered 10 – 15. If a ball is drawn at random from the box, find the probability that it is red or odd-numbered.
9. A mathematics class has 15 engineering majors, 12 science majors, 10 business majors, and no dual majors. Five of the engineering majors, 3 of the science majors, and 6 of the business majors are males. Find the probability that a student selected at random from this class is either an engineering major or a male.
10. The table describes the adult population of a small town. What is the probability of being age 30 or less or making between \$20,000 and \$40,000?

	INCOME		
Age	Under \$20,000	\$20,000 - \$40,000	Over \$40,000
30 or less	950	1000	150
Over 30	50	800	1000

11. Two cards are drawn without replacement from a box that contains 6 blue cards numbered 1 – 6 and 11 white cards numbered 7 – 17. What is the probability that the second card is blue, given the first card is white?
12. A bag contains 3 red marbles, 4 white marbles, and 2 black marbles. Find the probability of getting a red on the first draw, a white on the second draw, and a black on the third draw if the marbles are drawn without replacement.
13. Two cards are drawn without replacement from a regular deck of 52 playing cards. Find the probability that both cards are the same suit, given the first card is the jack of spades.
14. Two poker chips are drawn with replacement from a box containing 6 blue chips and 11 white chips. Find the probability that both chips are blue.
15. Two poker chips are drawn without replacements from a box containing 6 blue chips and 11 white chips. Find the probability that one chip is blue and one is white.

Answers

1. $\frac{6}{36} = \frac{1}{6}$

2. $\frac{26}{52} + \frac{4}{52} - \frac{2}{52} = \frac{28}{52} = \frac{7}{13}$

3. $\frac{2}{52} = \frac{1}{36}$

4. $\frac{9}{15} + \frac{5}{15} - \frac{2}{15}$

5. $15000 - 12500 = 2500$ $\frac{2500}{30,000} = \frac{1}{12}$

6. a. $\frac{\frac{1}{6}}{1 - \frac{1}{6}} = \frac{\frac{1}{6}}{\frac{5}{6}} = \frac{1}{5} \rightarrow 1:5$

b. 5:1

7. $2:7 \rightarrow 7:2 \rightarrow \frac{7}{2} = \frac{P}{1-P}$ $7(1-P) = 2P$ $7 - 7P = 2P$ $7 = 9P$ $P = \frac{7}{9}$

8. $\frac{9}{15} + \frac{8}{15} - \frac{5}{15} = \frac{12}{15} = \frac{4}{5}$

9.

	Male	Female	Total
Engineering	5	10	15
Science	3	9	12
Business	6	4	10
Total	14	23	27

$$\begin{aligned} P(E \cup M) &= P(E) + P(M) - P(E \cap M) \\ &= \frac{15}{37} + \frac{14}{37} - \frac{5}{37} = \frac{24}{37} \end{aligned}$$

$$10. \frac{2100}{3950} + \frac{1800}{3950} - \frac{1000}{3950} = \frac{2900}{3950} = \frac{58}{79}$$

$$11. \frac{6}{16} = \frac{3}{8}$$

$$12. \frac{3 \cdot 4 \cdot 2}{9 \cdot 8 \cdot 7} = \frac{24}{504} = \frac{1}{21}$$

$$13. \frac{12}{51} = \frac{4}{17}$$

$$14. \frac{6 \cdot 6}{17 \cdot 17} = \frac{36}{289}$$

$$15. \text{1}^{\text{st}} - \text{Blue} \quad \text{2}^{\text{nd}} \text{ is White} \quad \text{OR} \quad \text{1}^{\text{st}} - \text{White} \quad \text{2}^{\text{nd}} \text{ is Blue}$$
$$\frac{6 \cdot 11}{17 \cdot 16} + \frac{11 \cdot 6}{17 \cdot 16} = \frac{66}{272} + \frac{66}{272} = \frac{132}{272} = \frac{33}{68}$$