

Probability Review Key

1. Outcomes: HTT, THT, TTH, HTH, HHH, HHT, THH, TTT

Only 1 H: $\frac{3}{8}$

2. $p = \frac{13C5}{52C5} = \frac{1287}{2598960}$

3. a. $\frac{4}{11} \cdot \frac{2}{11} = \frac{8}{121}$

b. $\frac{5}{11} \cdot \frac{0}{10} = 0$ (No white in the jar)

c. $\frac{5}{11} \cdot \frac{4}{10} = \frac{2}{11}$

4. a. $\frac{1}{7P7} = \frac{1}{5040}$

b. $\left(\frac{1}{5040}\right)^3 = 7.811 \times 10^{-12}$

5. Total outcomes = $52 \cdot 6 \cdot 2 = 624$

a. $\frac{1}{52} \cdot \frac{1}{6} \cdot \frac{1}{6} = \frac{1}{624}$

b. $\frac{12}{52} \cdot \frac{3}{6} \cdot \frac{1}{6} = \frac{3}{52}$

6. Lets say class of 25 \rightarrow 15 boys \rightarrow 10 blonds \rightarrow 3 boy + blond
 $\frac{15}{25} + \frac{10}{25} - \frac{3}{25} = \frac{22}{25}$

7. $\left(\frac{1}{2}\right)^9 = \frac{1}{512}$

8. $WXYZ = 4$
 $ABCD = 16$ $\frac{4}{16} = \frac{1}{4}$

$$9. r=4 \quad 5C4 \cdot (0.8)^4 \cdot (0.2)^1 = 0.4096$$

$$r=5 \quad 5C5 \cdot (0.8)^5 \cdot (0.2)^0 = 0.32768$$

$$0.4096 + 0.32768 = \boxed{0.737}$$

$$10. a. r=8 \quad 10C8 \cdot (.3)^8 \cdot (.7)^2 = 0.001$$

$$r=9 \quad 10C9 \cdot (.3)^9 \cdot (.7)^1 = 0.0001$$

$$r=10 \quad 10C10 \cdot (.3)^{10} \cdot (.7)^0 = 0.000006$$

$$\text{Sum} = 0.001 + 0.0001 + 0.000006 = \boxed{0.0011}$$

$$b. r=7 \quad 10C7 \cdot (.3)^7 \cdot (.7)^3 =$$

$$= \boxed{0.009}$$

$$11. a. r=0 \quad 8C0 \cdot \left(\frac{2}{6}\right)^0 \cdot \left(\frac{4}{6}\right)^8 = 0.039$$

$$r=1 \quad 8C1 \cdot \left(\frac{2}{6}\right)^1 \cdot \left(\frac{4}{6}\right)^7 = 0.156$$

$$r=2 \quad 8C2 \cdot \left(\frac{2}{6}\right)^2 \cdot \left(\frac{4}{6}\right)^6 = 0.273$$

$$0.039 + 0.156 + 0.273 = \boxed{0.468}$$

$$b. r=3 \quad 8C3 \cdot \left(\frac{1}{2}\right)^3 \cdot \left(\frac{1}{2}\right)^5 =$$

$$= \boxed{0.219}$$

c. Consider the complement of

$$r=7 \quad 8C7 \cdot \left(\frac{1}{6}\right)^7 \cdot \left(\frac{5}{6}\right)^1 = 0.00002$$

$$r=8 \quad 8C8 \cdot \left(\frac{1}{6}\right)^8 \cdot \left(\frac{5}{6}\right)^0 = 0.000006$$

$$\text{Sum} = 0.00002 + 0.000006$$

$$= \boxed{2.06 \times 10^{-5}}$$

$$12. 9 \times 9 = 81 \quad 3 \times 3 = 9$$

$$\frac{81-9}{81} = \frac{72}{81} = \frac{8}{9}$$

$$13. a. \frac{16\pi}{576} = \frac{\pi}{36} = \boxed{0.087}$$

$$b. \frac{20\pi}{576} = \frac{5\pi}{144} = \boxed{0.109}$$

$$c. \frac{28\pi}{576} = \frac{7\pi}{144} = \boxed{0.153}$$

$$14. \text{ less than } 800 \quad \frac{3}{2,4,5} \quad \frac{4}{\text{all}} \quad \frac{4}{\text{all}} = 48$$

$$\text{even} \quad \frac{4}{\text{all}} \quad \frac{4}{\text{all}} \quad \frac{3}{2,4,8} = 48$$

$$15. 6 \times 4 \times 12 = 288$$

$$16. 8P_1 \cdot 16P_1 \cdot 7P_1 \cdot 15P_1 \cdot 6C_2 \cdot 14C_4 \\ = 201,801,600$$

$$17. 5C_3 = 10$$

$$18. 9C_2 \cdot 7C_3 = 1260$$

$$19. 4^5 = 1024$$

$$20. \frac{1}{1024}$$

$$21. \frac{5}{9} + \frac{3}{9} - \frac{2}{9} = \frac{6}{9} = \frac{2}{3}$$

$$22. \frac{4}{9} \cdot \frac{4}{9} = \frac{16}{81}$$

$$23. \frac{5}{9} + \frac{1}{9} = \frac{6}{9} = \frac{2}{3}$$

$$24. \frac{5}{9} \cdot \frac{4}{8} = \frac{5}{18}$$

$$25. E = 9.50\left(\frac{4}{52}\right) + 0.50\left(\frac{4}{52}\right) + (-0.50)\left(\frac{44}{52}\right) \\ = \$0.35$$

$$26. \text{Win 3 face cards} = \frac{12}{52} \cdot \frac{11}{51} \cdot \frac{10}{50} = \frac{11}{1105}$$

$$E = (\$3)\left(\frac{11}{1105}\right) + (-1)\left(\frac{1094}{1105}\right) \\ = -\$0.96$$

You are expected to lose money so you should not play

$$27. \text{Apple} = \frac{6}{20} = \frac{3}{10} \quad \text{Orange} = \frac{10}{20} = \frac{1}{2} \quad \text{Grapefruit} = \frac{1}{20}$$

$$\text{Mango} = \frac{3}{20}$$