

$$1) \left. \begin{array}{c} 1 \\ 2 \\ 3 \\ 4 \\ 5 \end{array} \right\} \begin{array}{c} 11 \\ 10 \\ 9 \\ 8 \\ 7 \end{array} \} 5 \text{ ways}$$

$$2) \underline{2} \underline{1} \underline{6} \underline{5} \underline{4} \underline{3} \underline{2} \underline{1} \\ 1440 \text{ ways}$$

$$3) 4 \cdot 6 \cdot 2 = 48 \text{ ways} \quad 4) \underline{10} \underline{10} \underline{10} \underline{10} = 10000$$

$$5) \frac{8!}{2!2!2!} = 5040$$

$$6) \frac{12!}{2!2!2!} = \frac{12 \cdot 11 \cdot 10 \cdot 9 \cdot 8 \cdot 7 \cdot 6 \cdot 5 \cdot 4}{8} = 19958400$$

$$7) 10! = 3,628,800$$

$$8) {}_7C_2 \cdot {}_{11}C_2 = 21 \cdot 55 = 1155$$

$$9) {}_{20}C_{15} = 15504$$

$$10) \underline{54} \underline{53} \underline{52} \underline{51} \underline{50} \underline{49} = 1.86 \times 10^{10}$$

$$11) \frac{1}{9}$$

$$12) \frac{1}{5} \cdot \frac{1}{4} \cdot \frac{1}{3} \cdot \frac{1}{2} \cdot \frac{1}{1} = \frac{1}{120}$$

$$13) a) \frac{416}{1000}$$

$$b) \frac{800}{1000}$$

$$c) \frac{74}{1000}$$

$$d) \frac{50}{1000} + \frac{416}{1000} - \frac{14}{1000}$$

$$14) \frac{1}{6}$$

$$15) \text{ type of pair} \rightarrow {}_{13}C_1 = 13$$

$$\text{choose 2} \rightarrow {}_4C_2 = 12$$

$$\text{other pair} \rightarrow {}_{12}C_1 = 12$$

$$\text{choose 2} \rightarrow {}_4C_2 = 12$$

$$\text{3rd} \rightarrow {}_{11}C_1 = 11$$

$$247104$$

$$52C_5$$

$$\frac{247104}{31875200} =$$

$$16) 1 - \frac{13}{52} = \frac{39}{52}$$

$$17) \frac{24}{52}(2) + \frac{28}{52}(-1) = \$.38$$

$$18) \frac{24}{36}(9) + \frac{30}{36}(-18) = \$.9$$

$$19) \frac{1}{40C_3}(1000) + \frac{9879}{9880}(-2) = \$.190$$

$$20) \frac{1}{40} \cdot \frac{1}{39} \cdot \frac{1}{38}(1000) + \frac{59279}{59280}(-2) = \$.198$$

$$22) .8(1000) + .2(6000) = \$2000$$

$$23) E(W) = \frac{4}{6}(-1)$$

$$E(L) = \frac{2/6(2)}{0}$$

$$4) \frac{2}{3}(0) + \left(\frac{1}{6}\right)(1) + \left(\frac{1}{12}\right)(2) + \left(\frac{1}{12}\right)(3) = .58$$

$$25) 3\left(\frac{1}{6}\right)\left(\frac{5}{6}\right)\left(\frac{5}{6}\right)(2) + 3\left(\frac{1}{6} \cdot \frac{1}{6} \cdot \frac{5}{6}\right)(3) + \left(\frac{1}{6} \cdot \frac{1}{6} \cdot \frac{1}{6}\right)\left(\frac{5}{6} \cdot \frac{5}{6} \cdot \frac{5}{6}\right)(-1) = .34$$

$$6) \begin{array}{l} 2 \rightarrow \frac{1}{4}(10) \\ 1 \rightarrow \frac{2}{4}(0) \\ 0 \rightarrow \frac{1}{4}(5) \\ \hline 3.75 \end{array}$$