

HW Section 8.1 p. 519

⑦ $X =$ the number of children with type O blood.

$$B(5, .25) \quad n=5 \quad p=.25 \quad q=.75$$

$$P(X=3) = {}_5C_3 (.25)^3 (.75)^2 = 0.0879$$

The probability that exactly 3 out of 5 randomly selected children will have type O blood is 8.79%.

⑧ $X =$ the number of broccoli plants that die

$$B(10, .05) \quad n=10 \quad p=.05 \quad q=.95$$

$$P(X \leq 1) = {}_{10}C_0 (.05)^0 (.95)^{10} + {}_{10}C_1 (.05)^1 (.95)^9 \\ = 0.9139$$

The probability that at most 1 out of 10 randomly selected broccoli plants dies is 91.39%.

⑨ $X =$ the number of children with type O blood.

$$B(5, .25) \quad n=5 \quad p=.25 \quad q=.75$$

$$P(X \geq 1) = 1 - P(X=0) = 1 - {}_5C_0 (.25)^0 (.75)^5 = 0.7627$$

The probability that at least 1 out of 5 randomly selected children has type O blood is 76.27%.

⑩ $X =$ the number of basketball players who graduate

$$B(20, .8) \quad n=20 \quad p=.8 \quad q=.2$$

$$a) P(X=11) = {}_{20}C_{11} (.8)^{11} (.2)^9 = .0074$$

The probability that exactly 11 out of 20 randomly selected basketball players graduate is .74%.

$$b) P(X=20) = {}_{20}C_{20} (.8)^{20} (.2)^0 = .0115$$

The probability that exactly 20 out of 20 randomly selected basketball players graduate is 1.15%.

$$c) P(X < 20) = 1 - P(X=20) = 1 - {}_{20}C_{20} (.8)^{20} (.2)^0 \\ = .9885$$

The probability that less than 20 out of 20 randomly selected basketball players graduate is 98.85%.

⑪ $X =$ the number of Hispanics on the committee

$$B(15, .3) \quad n=15 \quad p=.3 \quad q=.7$$

$$a) P(X=3) = {}_{15}C_3 (.3)^3 (.7)^{12} = 0.1701$$

The probability that exactly 3 out of 15 randomly selected people for the committee are Hispanic is 17.01%.

$$b) P(X=0) = {}_{15}C_0 (.3)^0 (.7)^{15} = 0.0047$$

The probability that none of the 15 randomly selected people for the committee are Hispanic is 0.47%.

(b) $X =$ the number of men called.

$$B(30, 0.7) \quad n=30 \quad p=.7 \quad q=.3$$

$$a) P(X=20) = {}_{30}C_{20} (.7)^{20} (.3)^{10} = 0.1416$$

The probability that exactly 20 of the 30 randomly called people are men is 14.16%.

$$\begin{aligned} b) P(\text{1st woman is the 4th call}) &= (M)(M)(M)(F) \\ &= (.7)(.7)(.7)(.3) \\ &= .1029 \end{aligned}$$

The probability that the first woman reached is on the fourth call is 10.29%.