

1.
 - a. No, the trials are not independent because the books are selected without replacement.
 - b. Yes; each trial (visit to the café) is binary because the person either can access the internet (success) or cannot access the internet (failure). The trials are independent, the number of trials is fixed ($n = 5$), and the probability of success is the same for each trial ($p = 0.96$).

2.
 - a. X is binomial because each die either earns points by landing on a 1 or 5 (success) or doesn't earn points by landing on a 2, 3, 4, or 6 (failure). Each die lands independently of the other dice. The number of trials is fixed with $n = 6$ and the probability of success is $p = \frac{2}{6} = \frac{1}{3} = 0.333$.
 - b. $P(X = 4) = \frac{6}{4} \frac{1}{3}^4 \frac{2}{3}^2 = 0.0823$

3. No, even though the number of ways to choose 1 success and the number of ways to choose 4 successes out of 5 trials is the same, to find the probability of each of these events, the rest of the binomial formula is needed. To calculate the probability of 1 day of rain, the formula is $5(0.3)^1(0.7)^4 = 0.3601$ which is much higher than the probability of 4 days of rain $= 5(0.3)^4(0.7)^1 = 0.0284$.

4.
 - a. Let X represent the number of people in the sample who open the email. X is a binomial random variable with $n = 10$ and $p = 0.38$.
 - b. $P(X = 6) = {}_{10}C_6(0.38)^6(0.62)^4 = 0.0934$

5.
 - a. 89.3 free throws
 - b. $P(X = 89) = 0.1785$. The probability that Girard makes exactly 89 of his 94 attempted free throws is 0.1785.
 - c. $P(X \geq 92) = P(X = 92) + P(X = 93) + P(X = 94) = 0.1454$

6. D

7. A