

1.
 - a. Binomial, $n = 5$, $p = 0.93$
 - b. Not binomial
 - c. Binomial, $n = 8$, $p = 0.85$

2.
 - a. Yes. Each toss is either a success (softball lands in the basket) or failure (softball does not land in the basket), the outcomes of the tosses are independent, the number of trials is fixed ($n = 5$), and the probability of success is the same for each trial, $p = 0.27$.
 - b. $P(x = 3) = {}_5^3 (0.27)^3 (0.73)^2 \approx 0.1049$ or $\text{binompdf}(n = 5, p = 0.27, x = 3) \approx 0.1049$
 - c.

Number of successes	0	1	2	3	4	5
Probability	0.2073	0.3834	0.2836	0.1049	0.0194	0.0014
 - d. $P(X \geq 4) = 0.0194 + 0.0014 = 0.0208$ or $1 - \text{binomcdf}(n = 5, p = 0.27, x = 3) \approx 0.0208$

3.
 - a. $\mu = np = 20(0.22) = 4.4$. If this study were repeated many times with groups of 20 patients, the average number of patients who would experience nausea after taking the new weight loss medication would be about 4.4 patients.
 - b. $\sigma = \sqrt{np(1-p)} = \sqrt{20(0.22)(0.78)} \approx 1.8526$ If this study were repeated many times with groups of 20 patients, the number of patients who would experience nausea after taking the new weight loss medication would typically vary by 1.8526 patients from the mean of 4.4 patients.
 - c. $P(N = 0) = {}_{20}^0 (0.22)^0 (0.78)^{20} \approx 0.0069$ or $P(N = 0) = \text{binompdf}(n = 20, p = 0.22, x = 0) \approx 0.0069$
 - d. $P(N \geq 1) = 1 - P(N = 0) = 1 - 0.0069 \approx 0.9931$

4.
 - a. $P(X = 5) = \text{binompdf}(n = 12, p = 0.3, x = 5) \approx 0.1585$
 - b. $P(X = 8 \text{ or } X = 9) = \text{binompdf}(n = 12, p = 0.3, x = 8) + \text{binompdf}(n = 12, p = 0.3, x = 9) \approx 0.0078 + 0.0015 \approx 0.0093$
 - c. $P(X \leq 4) = \text{binomcdf}(n = 12, p = 0.3, x = 4) \approx 0.7237$

5.
 - a. X = the number of days Dante's bus is late out of 21 days. The distribution of X is binomial with $n = 21$ and $p = 0.17$.
 - b. $P(X \geq 10) = 1 - P(X \leq 9) = 1 - \text{binomcdf}(n = 21, p = 0.17, x = 9) \approx 1 - 0.9989 \approx 0.0011$

6. A

7. A