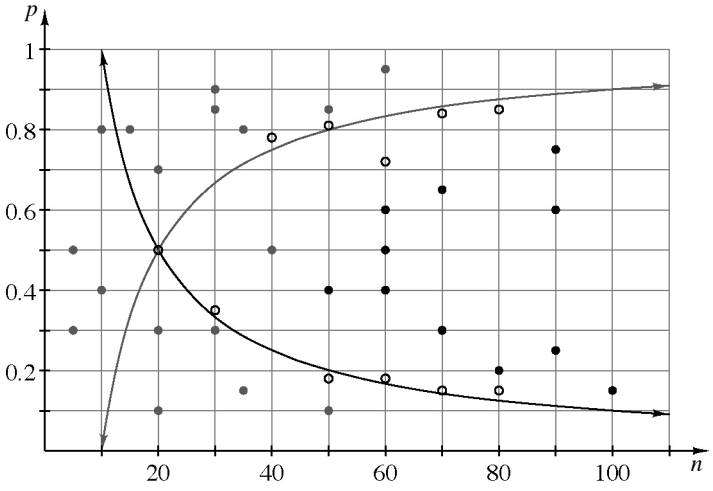
Lesson 6.2.5

6-74. c. See sample class graph below.



6-75. These graphs do appear to be approximately normally distributed. They can never be exactly normally distributed because the binomial distribution is a discrete distribution, and the normal distribution is a continuous distribution.

6-76. a. $P(X \leq 30) = 0.3687$

b. Answer: $\mu_X = 32$, $\sigma_X = 4.382$. We expect 32 "yes" and 48 "no" results, both larger than 10.

c. $P(X \leq 30) = 0.3240$. It seems somewhat far away from 0.3687.

6-77. $P(X \leq 30.5) = 0.3661$, much closer to 0.3687. 30.5 was chosen because the "30-bar" spans from 29.5 to 30.5.

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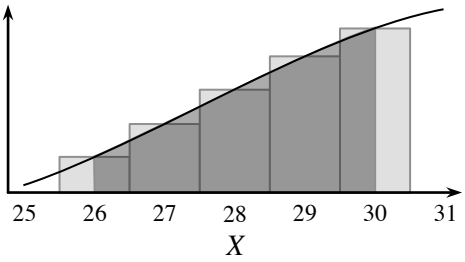
6-78. a. $P(26 \le X \le 30) = 0.3013$

b. $P(26 \le X \le 30) = 0.2386$. A terrible approximation!

c. $P(25.5 \le X \le 30.5) = 0.2971$. Much better!

d.



6-79. a. $P(X > 200) = 0.2539$

b. $\mu_X = (300)(0.65) = 195$, $\sigma_X = \sqrt{(300)(0.65)(1-0.65)} = 8.261$.

c. We expect 195 "yes" and 105 "no" results, both many more than 10. The number of "yes" results is therefore approximately normally distributed.

d. Without continuity correction, $P(X > 200) = 0.2725$.
With continuity correction: $P(X > 200.5) = 0.2528$

6-80. a. The correlation coefficient: This is a unitless number that gives information about the strength and direction of an association; the value itself cannot be directly applied to any meaning.

b. The coefficient of determination: the square of r and is always a positive number between 0 and 1. It is often written as a percent and can be interpreted as "the percent of the variation in the response variable that can be explained by a linear association with the explanatory variable."

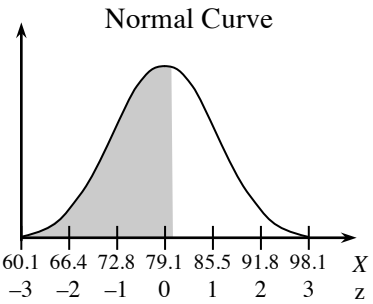
c. The standard deviation of the residuals, tells the distance between the response value of a typical point and the value predicted by the LSRL for that point.

d. The y-intercept of the LSRL, which tells the estimated value of the response variable when the explanatory variable is 0. Often the interpretation of a involves extrapolation.

e. The slope of the LSRL, which tells the expected change in the response variable for a change of one unit in the explanatory variable.

f. The predicted value of the response variable for any given value of the explanatory variable.

6-81. See sketch at right. Using an inverse normal probability density function or table: z = –0.27934;
$X = 79.13 + (-0.27934) \cdot 6.34$; $X = 77.359\%$



6-82. Place the money in room B; $P(\text{B}) = \frac{5}{9}$.

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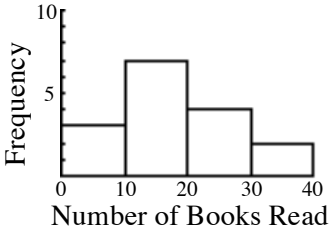
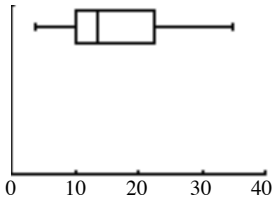
6-83. a. 

b. The data is nearly symmetric with no outliers so either mean or median are appropriate. mean = 16.6875 books, median = 13.5 books

c. 

d. The typical student reads about 13.5 books; the distribution is nearly symmetrical and single-peaked; some students may say there is a slight right skew, apparent in the boxplot; the IQR is 12.5 books so the number of books read by the middle half of students is spread over about 12 or 13. There are no apparent outliers.

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