Lesson 6.2.3

6-52. Binomial pdf, $n = 50, p = 0.16, X = 8$. $P(X = 8) = 0.1523$

6-53. $P(X = 8) = \binom{50}{8}(0.16)^8(1 - 0.16)^{42} = 0.1523$. The answer matches.

6-54. Binomial cdf, $n = 50, p = 0.16$, $X = 8$. $P(X \le 8) = 0.5929$

6-55. $P(X > 8) = 1 - 0.5929 = 0.4071$

6-56. Binomial cdf, $n = 50, p = 0.16, X = 7$. $P(X < 8) = 0.4406$

6-57. a. Binomial pdf at $X = 7$, $X = 8$, $X = 9$, and $X = 10$ with $n = 50$ and $p = 0.16$: 0.1487, 0.1523, 0.1353, 0.1057. Adding these for the answer: $P(7 \le X \le 10) = 0.5420$.

b. She can use the binomial cdf function with $X = 10$ and subtract the cdf function with $X = 6$: $P(7 \le X \le 10) = 0.8339 - 0.2919 = 0.5420$.

6-58. Binomial setting with $n = 100$ and $p = 0.16$. Subtract the cdf function at $X = 20$ and $X = 9$: $P(10 \le X \le 20) = 0.8879 - 0.0316 = 0.8563$.

6-59. $P(X = 2) = \text{binompdf}(7, 0.65, 2) = 0.0466$

6-60. $P(X = 10) = \text{binompdf}(12, 0.55, 10) = 0.0339$

6-61. a. $P(X = 3) = \text{binompdf}(15, 0.14, 3) = 0.2044$)

b. $P(\text{score} \ge 3) = 0.2446 + 0.2091 + 0.14000 = 0.5937$, $E(X) = 0.5937(15) = 8.91$ or about 9

c. $P(X \ge 10) = 1 - P(X \le 9) = 1 - \text{binomcdf}(15, 0.5937, 9) = 0.3839$

6-62. a.

		#2			
		$P(\text{R}) = \frac{1}{4}$	$P(\text{G}) = \frac{1}{4}$	$P(\text{B}) = \frac{1}{4}$	$P(\text{Y}) = \frac{1}{4}$
#1	$P(\text{R}) = \frac{2}{3}$	$\frac{1}{6}$ win	$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$
	$P(\text{B}) = \frac{1}{3}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$ win	$\frac{1}{12}$

b. $P(\text{win}) = \frac{1}{6} + \frac{1}{12} = \frac{1}{4}$

c. $P(R \mid \text{win}) = \frac{\frac{1}{6}}{\frac{1}{4}} = \frac{2}{3}$

6-63. a. $P(X > 20) = 0.6821$

b. $P(15 \le X \le 20) = P(X \le 20) - P(X \le 14) = 0.3174$

c. $P(X = 18) = 0.0441$

6-64. See diagrams below.

Center: Both types of colleges assign the same median of 12 novels.

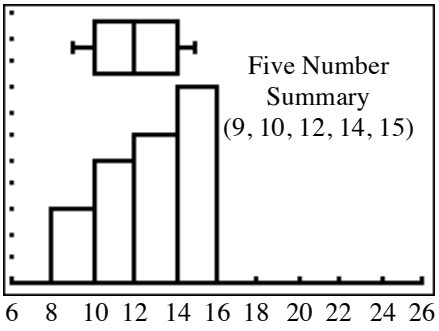
Shape: The distribution for community colleges is skewed to the left, with a low of 8 to 9 novels and increasing to a peak at 14 to 15 novels. The distribution for universities is skewed to the right, with a peak at 10 to 11 novels.

Spread: The variability in the number of novels assigned at the community college level is much less than the variability between courses at the university level. The IQR for community colleges is 4 novels (14 – 10 = 4), while the university IQR of 6 novels (15 – 9 = 6) is one and a half times as wide.

Outliers: One course at a university is an outlier; 25 books are assigned in that course. 25 books are far away from the bulk of novels assigned in university courses.

Conclusions: The university professors claim that their courses are more demanding because they assign more novels. However, that data does not bear this claim out. 25% of university courses assign more novels than any of the community college courses (the right "whisker," or the top 25% of the courses, for universities is beyond the entire boxplot for community colleges). But just as dramatically, 25% of the university classes assign *fewer* books than any of the community colleges (the left "whisker," or lowest 25%, for universities is *below* the entire boxplot for community colleges). Furthermore, the median number of novels assigned at the two universities is the same—12 books. Community colleges are more consistent from course-to-course in the number of novels they assign (IQR is 4) than are the universities (IQR is 6).

Community College



University