6.3 Binomial Random Variables continued

#79, 81, 83

79. a. $P(X = 17) = \binom{20}{17}(.85)^{17}(.15)^{3} = 0.2428$

b. $P(X<12) = \binom{20}{0}(.85)^{0}(.15)^{20} + \ldots + \binom{20}{12}(.85)^{12}(.15)^{8}$

= 0.0059. This is low. Judy should be suspicious.

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81. a. $\mu_x = 15(0.20) = 3$

If we watched the machine make sets of 15 calls, we would expect about 3 calls to reach a live person, on average.

b. $\sigma_x = \sqrt{15(0.20)(0.80)}$

= 1.55. If we watched the machine make many sets of 15 calls, we would expect the number of calls that reach a live person to typically vary by about 1.55 from the mean of 3.

83. a. $\mu_y = 15(0.80) = 12$

Notice that $\mu_x = 3$ ... and $12 + 3 = 15$ (total # of calls)

b. $\sigma_y = \sqrt{15(0.80)(0.20)}$

$= 1.55$

This is the same value as σ_x because $Y = 15 - X$ and adding a constant to a random variable doesn't change the spread.