Ch 4.3 Binomial Probability Distributions

Have to have the following criteria:
1. fixed number of trials
2. trials are independent
3. each trial must have all outcomes classified into 2 categories.
4. probability must remain constant.

Apr 25-8:41 AM

Ex1) 90% of the graduates at a State University apply to medical school are admitted. This year 6 applied. Find the p(that 4 will be accepted).

formula: $_nC_x \cdot p^x \cdot q^{n-x}$

#ways it can occur x p(event) x p($\overline{\text{event}}$)

$_6C_4 \times .90^4 \times .10^2$

.0984 about 10%

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Ex1b) The probability a car parked out in from of its house on the street gets stolen is 1/120. What is the probability **no cars get stolen** if there are 5 cars on the street?

$_5C_0 \times (1/120)^0 \times (119/120)^5$

= .9590 about 96%

P(1 gets stolen)

$_5C_1 \times (1/120)^1 \times (119/120)^4$

=.0403 about 4%

Apr 25-10:56 AM

Try#1. Find the probability 8 out of 10 kids pass the exam if the probability of passing is 95%.

.074

Apr 25-11:47 AM

Ex2a) Your taking a multiple choice test with 5 questions each having 4 possible answers. If you guess on everyone, what is the probability you'll get at least 4 correct)?

P(4 correct) or P(5 correct)
* add them for an or problem.

$_5C_4 \times (1/4)^4 \times (3/4)^1 + {}_5C_5 \times (1/4)^5 \times (4/5)^0$

1/64

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Ex2b) Shipment of 100 tires have 20 defects. What is the probability 5 selected at random and each tire is replaced that **at most 2 are defective**?

P(0) + P(1) +P(2) are defective

$P(0) = {}_5C_0 \times (1/5)^0 \times (4/5)^5 =$ 1024/3125

$P(1) = {}_5C_1 \times (1/5)^1 \times (4/5)^4 =$ 1280/3125

$P(2) = {}_5C_2 \times (1/5)^2 \times (4/5)^3 =$ 640/3125

.9421

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Ex1c) At least one tire is defective?

1 - (no defects)^5

$1-({}_5C_0 \times (1/5)^0 \times (4/5)^5)$

.67232

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Try#2. You have 4 batteries and you know two of the 4 batteries are bad, but don't know which two. If you need to select 3 batteries for your controller, what is the probability you will get at least 2 good batteries?

.625

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