Name: Key Section (Circle One): 8:00 - 8:50 10:00 - 10:50

Math 110 Supplemental Instruction Worksheet 8

1. Suppose 5 apples in a barrel of 25 apples are known to be rotten. A sample of 2 are chosen.
   (a) Find a probability distribution for the number of good apples in the sample.

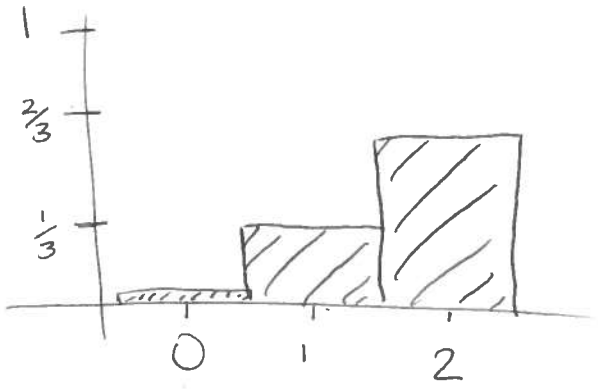
x	0	1	2
P	$\frac{1}{30}$	$\frac{10}{30}$	$\frac{19}{30}$

$x=0$: $\frac{\binom{5}{2}}{\binom{25}{2}} = \frac{10}{300} = \frac{1}{30}$

$x=1$ $\frac{\binom{5}{1}\binom{20}{1}}{\binom{25}{2}} = \frac{100}{300} = \frac{1}{3}$

$x=2$ $\frac{\binom{5}{0}\binom{20}{2}}{\binom{25}{2}} = \frac{190}{300} = \frac{19}{30}$

   (b) Draw a histogram for the number of good apples in the sample.



2. In a particular factory, it is known that 2% of items are defective. In a run of 150 items, what is the expected number of defective items?

$E(\text{defective}) = n \cdot p$

$= 150 \cdot .02 = 3$

3. The following table shows the probability distribution for the number of cats in the tree in the math courtyard:

X	0	1	2	3	4
p	.24	.07	.35		.12

(a) Find in the missing value in the table.

$1 - (.24 + .07 + .35 + .12) = 1 - .78 = .22$

(b) What is the expected number of cats in the tree?

$E(\text{cats}) = 0 \cdot .24 + 1 \cdot .07 + 2 \cdot .35 + 3 \cdot .22 + 4 \cdot .12$

$= 1.91 \text{ cats}$

4. Find the standard deviation of the set

32, 41, 47, 53, 57

$\text{mean} = \frac{230}{5} = 46$

$$s = \sqrt{\frac{32^2 + 41^2 + 47^2 + 53^2 + 57^2 - 5 \cdot 46^2}{5-1}}$$

$$= \sqrt{\frac{10972 - 10580}{4}} = \sqrt{\frac{392}{4}} = \sqrt{98} = 9.90$$