Week in Review #5

1. (a) This part is not a binomial problem since which trials are success and which are failures are specified. Use a tree to get this answer.
$\frac{2}{5}\frac{2}{5}\frac{2}{5}\frac{3}{5}\frac{3}{5} = \left(\frac{2}{5}\right)^3 * \left(\frac{3}{5}\right)^2$
   (b) n=5, p= $\frac{2}{5}$, r=4
   binompdf(5,0.4,4) = 0.0768
   (c) n=5, p= $\frac{2}{5}$, r=2, 3, 4
   binompdf(5,0.4,2) + binompdf(5,0.4,3) + binompdf(5,0.4,4)
   or binomcdf(5,0.4,4) - binomcdf(5,0.4,1)
   Answer: 0.6528

2. note: p = probability of success. convert the number of failures to the number of success. one failure means 4 success; 2 failures means 3 success; ....

   n=5, p= $\frac{3}{7}$, r=0, 1, 2, 3, 4

   binomcdf(5,$\frac{3}{7}$,4)

   Answer: 0.9855

3. (a) n=25, p= $\frac{1}{6}$, r=0,1, 2, 3,4
   binomcdf(25,$\frac{1}{6}$,4)
   Answer: 0.5937
   (b) n=25, p= $\frac{2}{6}$, r=7, 8, 9,...,25
   binomcdf(25,$\frac{2}{6}$,25) - binomcdf(25,$\frac{2}{6}$,6)
   Answer: 0.7785
   (c) Since the first three rolls are multiples of three, this means the number of trials is actually 22 and we need at least 4 of the remaining 22 rolls to be a multiple of three.
   n=22, p= $\frac{2}{6}$, r= 4, 5, 6,...,22
   1 - binomcdf(22,$\frac{2}{6}$,3)
   Answer: 0.9649

4. (a) n=80, p= 0.15, r=5, 6, 7, 8, 9, 10, 11, 12
   binomcdf(80,0.15,12) - binomcdf(80,0.15,4)
   Answer: 0.57148
   (b) n=70(since we know the results of the first 10 people)
   p=0.015

   since 5 people of the first 10 had a reaction, we only need 12 more people to get a total of 17.
   r=12
   binomcdf(70,0.15,12)
   Answer: 0.1112

5. not binomial.

   $$\frac{C(15,6)C(55,4)}{C(70,15)}$$

6. n=7, p=$\frac{1}{12}$, r = 2, 3, 4, 5, 6,7
   Answer:1−binomcdf(7,$\frac{1}{12}$, 1) =0.1101

7. (a) infinite discrete.
   values: X= 1, 2, 3, ...
   (b) finite discrete.
   values: X= 0, 1, 2, 3,..., 12
   (c) continuous.
   values: room temp $\leq x \leq$temp of the heating element.
   (d) continuous.
   values $0 \leq X \leq$ length of class time. either 50 min or 75 min.

8. (a) $x = 2, 3, 4, 5$
   (b) prob dist.(given in two parts)

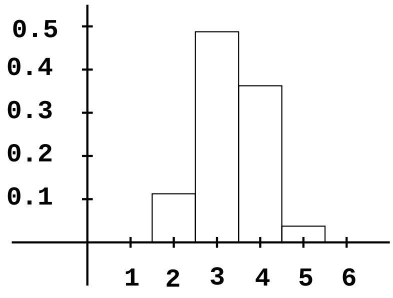
x	2	3
prob	$\frac{C(5,2)*C(4,4)}{C(9,6)}$	$\frac{C(5,3)*C(4,3)}{C(9,6)}$

x	4	5
prob	$\frac{C(5,4)*C(4,2)}{C(9,6)}$	$\frac{C(5,5)*C(4,1)}{C(9,6)}$

   or

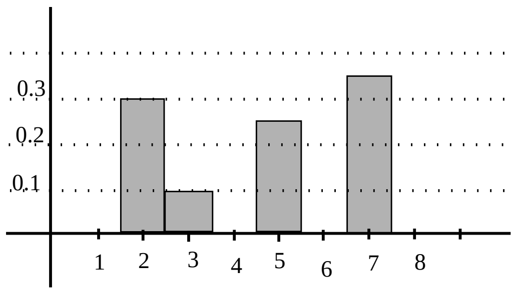
x	2	3	4	5
prob	$\frac{10}{84}$	$\frac{40}{84}$	$\frac{30}{84}$	$\frac{4}{84}$

   (c) Histogram



   (d) $\frac{30}{84}$
   (e) $\frac{10+40}{84} = \frac{50}{84}$

9. Histogram



10. draw the tree to make this problem easier

x	-2	-1	0	1	2	3	4
prob	$\frac{1}{2}$	$\frac{1}{12}$	$\frac{2}{15}$	$\frac{2}{15}$	$\frac{1}{20}$	$\frac{1}{20}$	$\frac{1}{20}$

11. $E(X) = 2 * \frac{10}{84} + 3 * \frac{40}{84} + 4 * \frac{30}{84} + 5 * \frac{4}{84}$

    $E(x) = 3.3333$

    Note: since Expected value is an average, don't round to the nearest integer.

12. E(x) $= -0.5$

13. Let X be the net winnings and let A be the cost of the game.

X	12-A	5-A	2-A	0	-A
prob.	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{2}{8}$	$\frac{1}{8}$	$\frac{3}{8}$

    Want $E(X) = 0$. Solve this equation for A.

    Answer: A = \$3

14. mean = 14.625
    median = 14.5
    mode: 12 and 16

15. Type the values of X into L_1,the frequency into L_2, and then compute
    1-Var Stats $\mathbf{L_1}$,$\mathbf{L_2}$

    mode: 10
    mean = 17.3571
    median = 12

16. Find a number to represent each interval. I'll use the middle value of the interval.

data	4.5	12.5	20.5	28.5
frequency	8	10	15	20

    estimated mean = 19.5943