

**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)  $n=5, p=\frac{2}{5}, r=4$   
 $\text{binompdf}(5,0.4,4) = 0.0768$

(c)  $n=5, p=\frac{2}{5}, r=2, 3, 4$   
 $\text{binompdf}(5,0.4,2) + \text{binompdf}(5,0.4,3) + \text{binompdf}(5,0.4,4)$   
 or  $\text{binomcdf}(5,0.4,4) - \text{binomcdf}(5,0.4,1)$   
 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; ....

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

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

Answer: 0.9855

3. (a)  $n=25, p=\frac{1}{6}, r=0,1, 2, 3,4$

$\text{binomcdf}(25,\frac{1}{6},4)$

Answer: 0.5937

(b)  $n=25, p=\frac{2}{6}, r=7, 8, 9, \dots, 25$   
 $\text{binomcdf}(25,\frac{2}{6},25) - \text{binomcdf}(25,\frac{2}{6},6)$

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.

$n=22, p=\frac{2}{6}, r= 4, 5, 6, \dots, 22$

$1 - \text{binomcdf}(22,\frac{2}{6},3)$

Answer: 0.9649

4. (a)  $n=80, p= 0.15, r=5, 6, 7, 8, 9, 10, 11, 12$

$\text{binomcdf}(80,0.15,12) - \text{binomcdf}(80,0.15,4)$

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.

$r=12$

$\text{binomcdf}(70,0.15,12)$

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:  $1 - \text{binomcdf}(7,\frac{1}{12}, 1) = 0.1101$

7. (a) infinite discrete.  
 values:  $X= 1, 2, 3, \dots$

- (b) finite discrete.  
 values:  $X= 0, 1, 2, 3, \dots, 12$

- (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)  $x = 2, 3, 4, 5$

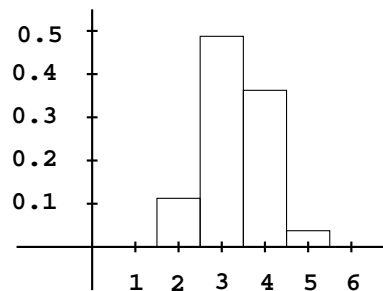
- (b) prob dist.(given in two parts)

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	$\frac{10}{84}$	$\frac{40}{84}$	$\frac{30}{84}$	$\frac{4}{84}$

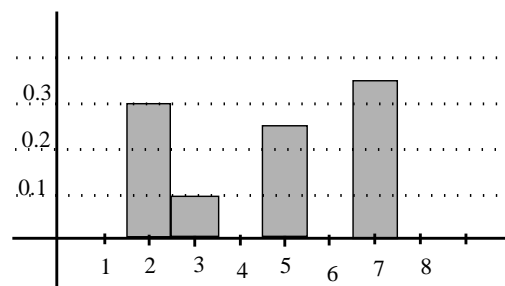
- (c) Histogram



(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(cars) into  $L_2$ , and then compute  
**1-Var Stats  $L_1, L_2$**

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