

Help can be found in class lecture, topics review or related PowerPoints

- What are Name the 4 **assumptions** in using binomial probability?
- What information goes on the tree diagram?
- What is the probability of success?
- What is the probability of failure?
- What is the summation of probability of success and probability of failure?
- What is the summation of probability column in a binomial probability distribution table?
- What are the two formulas to find mean or expected value for a binomial probability?
- What is the formula to find standard deviation for a binomial probability?
- What is the first and the last number that goes under X in the binomial probability distribution table?
- In using TI calculator what is the difference between **binompdf** and **binomcdf**?

Online Calculator: <http://stattrek.com/online-calculator/binomial.aspx>

YouTube TI Calculator: <https://www.youtube.com/watch?v=4sJx6PG9IQg> binompdf and binomcdf

YouTube TI Calculator: <https://www.youtube.com/watch?v=OheNYVWQu2A> Using table

YouTube TI Calculator: <https://www.youtube.com/watch?v=oS4AwUim-ic> binompdf and binomcdf

A) Given the number of trials and the probability of success, determine the probability indicated: For each problem draw the tree diagram

- $n = 12, p = 0.2, P(2 \text{ successes}) = ? = 0.283$ 2. $n = 10, p = 0.4, P(1 \text{ success}) = 0.040$
- $n = 20, p = 0.5, P(10 \text{ successes}) = 0.176$
- $n = 7, p = 0.45, P(\text{At most } 3 \text{ successes}) = 0.6083$ **Hint: Use binomcdf**
- $n = 7, p = 0.45, P(\text{At least } 4 \text{ successes})$ **Hint: Use answer from prior problem** $(1 - 0.6083) = 0.3917$
- $n = 8, p = 0.65, P(\text{At most } 2 \text{ failures}) = 0.4278$ **Hint: Use binomcdf**
- $n = 8, p = 0.65, P(\text{At least } 3 \text{ failure})$ **Hint: Use answer from prior problem** $= 0.5722$
- $n = 6, p = 0.35, P(\text{at least } 3 \text{ successes}) = 0.3529$
- $n = 100, p = 0.01, P(\text{no more than } 3 \text{ successes}) = 0.982$

B) If only 40% of university students graduate in 4 years, and we know 6 of friends who are going to university, then complete a probability distribution table based on $RV=X$ = number of our friends who will graduate in 4 years from university. Draw the probability distribution of number of students that will graduate in 4 years. Also answer question at the end of the table Also answer the following questions. (All answers in percentage and round in 2 decimal)

x	$p(x)$	$x \cdot p(x)$
0	0.0467	0
1		
2	0.3110	0.6220
3		
4		
5	0.0369	
6		
	1	2.4
		or = ? =

$P(x)$						
0.40						
0.30						
0.20						
0.10						
	0	1	2	3	4	5
						6

- Find the probability that at least 3 will graduate in 4 years. **Ans: 0.4557**
- Find the probability that at most 4 will graduate in 4 years. **Ans:0.9590**
- Find the probability that none will graduate in 4 years. **Ans:0.047**
- Find the probability that all lucky six will graduate in 4 years. **Ans:0.41**
- Expected number of students that will graduate in 4 years. **Ans:2.4 years**
- Standard deviation of number of students that will graduate in 4 years. **Ans:1.2**

16. In a history class, Colin and Diana both write a multiple choice quiz. There are 10 questions. Each question has five possible answers. What is the probability that

- a) Colin will pass the test if he guesses an answer to each question: Ans: $1 - .99914 = 0.00086$
 - b) Diana will pass the test if she studies so that she has a 75% chance of answering each question correctly: Ans: 0.776
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17. The manufacturing sector contributes 17% of Canada's gross domestic product. A customer orders 50 components from a factory that has a 99% quality production rate (99% of the products are defect-free). Find the probability that:

- a) none of the components in the order are defective: Ans: 0.605
 - b) there is at least one defective product in the order: Ans: 0.395
 - c) There are at least two defective products in the order: Ans: 0.089
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18. Approximately 3% of the eggs in a store are cracked. If you buy two dozen eggs, what is the probability that

- a) none of your eggs are cracked: Ans: 0.481
 - b) at least one of your eggs is cracked: Ans: 0.519
 - c) exactly two of your eggs are cracked: Ans: 0.127
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19. A pair of dice is rolled 20 times. What is the probability that a sum of 5 is rolled

- a) exactly 6 times: Ans: 0.014
 - b) at least 4 times: Ans: 0.175
 - c) at most 5 times: Ans: 0.982
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20. The probability the Tim will sink a foul shot is 70%. If Tim attempts 30 foul shots, what is the probability that

- a) he sinks exactly 21 shots: Ans: 0.157
 - b) he sinks at least 21 shots: Ans: 0.589
 - c) he sinks at most 21 shots: Ans: 0.568
 - d) he sinks between 18 and 20 shots, inclusive. Ans: 0.327
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21. A bag contains 4 red marbles and 5 blue marbles and 1 green. A marble is drawn and then replaced. This is done 50 times. What is the probability that a red marble is drawn:

- a) exactly 15 times: Ans: 0.042
 - b) at least 15 times: Ans: 0.946
 - c) at most 20 times: Ans: 0.561
 - d) between 17 and 25 times, inclusive: Ans: 0.787
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22. In basketball, Nicole makes 4 baskets for every 10 shots. If she takes 3 shots, what is the probability that exactly 2 of them will be baskets? Ans: 0.288

23. A spinner is divided into five equal sectors labeled 1 through 5. What is the probability of getting at most two prime numbers in three spins? Ans: 0.488

24. A traffic light on Hempstead Turnpike is green for 40 seconds, yellow for 5 seconds, and red for 15 seconds out of every minute. What is the probability that at least four of the next 5 cars get a green light?

ANS: 0.784

25. Sociologists say that 90% of married women claim that their husband's mother is the biggest bone of contention in their marriages. Suppose that six married women are having coffee together one morning. What is the probability that a) all of them dislike their mother-in law; b) none of them dislike their mother-in law; c) at least four of them dislike their mother-in law; d) no more than three of them dislike their mother-in law? Ans: a) 0.5314 b) 0.000001 c) 0.9842 d) 0.0159

26. In *Chances: Risks and Odds in Everyday Life*, James Burke claims that about 70% of all single men would welcome a woman taking the initiative in asking for a date. If 20 men are surveyed, what is the probability that a) at least 18 of the men will say yes; b) fewer than 3 of the men will say yes; c) none of the men will say yes; d) at least 5 of the men will say no? Ans:

a) 0.0354 b) 0.000001 c) 0.000001 d) 0.7625

27. About 40% of all drivers will flash their lights to warn oncoming traffic of a speed trap ahead. A) What is the probability at least one of seven drivers will warn oncoming traffic? B) What is the expected number of these seven drivers that will warn oncoming traffic of a police speed trap ahead? Ans: a) 0.9720 b) $2.8 \approx 3$

28. About 25% of those called for jury duty will find an excuse to avoid it. If 12 people are called a) What is the probability that all 12 will be available; b) That 6 or more will not be available to serve; c) Find the expected value of those available to serve. Ans:

a) 0.03167 b) 0.0544 c) 9