# Get ready for quiz

#### Grab a calculator

If two dice are thrown, what is the probability of getting a sum of 8?

**Outcomes for Two Dice** 

	1	2	3	4	5	6
1	(1, 1)	(1, 2)	(1, 3)	(1, 4)	(1, 5)	(1, 6)
2	(2, 1)	(2, 2)	(2, 3)	(2, 4)	(2, 5)	(2, 6)
3	(3, 1)	(3, 2)	(3, 3)	(3, 4)	(3, 5)	(3, 6)
4	(4, 1)	(4, 2)	(4, 3)	(4, 4)	(4, 5)	(4, 6)
5	(5, 1)	(5, 2)	(5, 3)	(5, 4)	(5, 5)	(5, 6)
6	(6, 1)	(6, 2)	(6, 3)	(6, 4)	(6, 5)	(6, 6)

# **Binomial Probability Distribution**

Two Options:
Success or Failure

### Sinomial Probability for One x Value

compute the binomial probability for **one particular number of successes**, use the mpdf function.

Keystrokes	[2nd VARS makes DISTR] [A 6 times] [STO.] [2000.000]		
Format	$binompdf(n, p, x) \rightarrow list$		

**ample 1**: Larry's batting average is .260. If he's at bat four times, what is the probability it he gets exactly two hits?

#### ution:

$$n = 4$$
,  $p = 0.26$ ,  $x = 2$ 

te: Some textbooks use r for number of successes, rather than x.

$$binompdf(4,.26,2) = 0.2221$$

$$n = 4$$

$$p = .260$$

$$r = 2$$

Problem 1: In a school survey 68% of the students have an Android device. What is the probability that 12 of a selecting of 20 have Android devices?

#### Solution:

n = 20 (20 classmates)

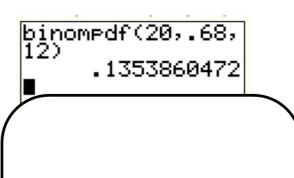
x = 12 (The amount of people who own an android)

p = .68 (probability that they are an Android user is a success,

because that is what we care about)

q = .32 (probability that the users does not own an android)

Reminder: Q=1-p and p=1-q thus q=1-.68=.32



Problem 2: What is the probability that out of 14 classmates that exactly 8 use iphones.

## PDF

Solution:

n = 14

x = 8 (The amount of people who own an iphone

p = .32 (Probability that they are an users is the success,

because that is what we care about)

q = .68 (Probability that they do not own an iphone)

When looking for and exact value use binomial pdf on your TI-84 and TI-83 calculator.

bindompdf(14,.32,8) is approximately .0326

[2ND] | [VARS] | [0] | [1] | [4] | [,] | [3] | [2] | [,] | [8] | [ENTER]

binompdf(14,.32,

.0326443958

Problem: What is the probability that out of 32 students 26 or less pass.

OF

N = 32

x = 26 (Number of students who passed)

p = .95 (Probability of passing)

q = .05 (Probability of failing)

Note P=1-Q and Q=1-P.

thus 1-.95 = .05 = Q

When finding a ranged of values use the binomcdf function.

[2ND] | [VARS] | [ALPHA] | [MATH] | [3] | [2] | [,] | [9] | [5] | [,] | [2] | [6]

binomcdf(32,.95, 26) .0045997456 Problem: What is the probability that from our sample of 32 a minimum of 3 students fai?

N = 32

x = 2 (The amount of people we think will fail)

p = .05 (Probability of failing, which is what we want to know about)

q = .95 (Probability of Success)

n=number of trials

x- number of success that happen during n trails

p = Probability of success [Note: If given the q then (p = 1-q)]

q = Probability of failure [Note: If given q then (q=1-p)]

Note: The probability that 3 or more students will fail is the same as 1 – the probability of 2 or less failing. With this fact we can use the binomcdf(n,p,x) to solve the problem.

1-binomcdf(32,.05,2)

[1] | [-] | [2ND] | [VARS] | [ALPHA] | [MATH] | [3] | [2] | [,] | [.] | [0] | [5] | [,] | [2]

1-binomodf(32,.0 5,2) \_2138855271











