

Probability Distributions and Histograms Notes

Probability Distribution:

* the sum of the probabilities in a probability distribution must equal 1.

Identify which of the following are examples of probability distributions.

Ex. 1:

Number of items on a large pizza

Number of items	0	1	2	3	4
Probability	0.3	0.4	0.2	0.06	0.04

yes → $\sum P(x) = 1$

Ex 2:

X	0	2	4	6
P(x)	0.34	0.15	0.41	0.09

no → $\sum P(x) = 0.99 \neq 1$

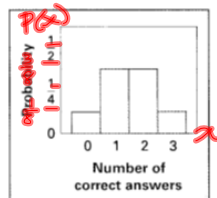
Probability Histogram:

"bar graph" of a probability distribution (no spaces)

Ex 4:

The following histogram represents the probability distribution of the number of true/false questions that students guessed correctly

X (number correct)	0	1	2	3
Outcomes	1	3	3	1
P(X)	$\frac{1}{8}$	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{1}{8}$



a) What is the probability a student guessed 1 correct answer?

$\frac{3}{8}$

b) What is the probability a student guessed at least one correct answer?

$\frac{3}{8} + \frac{3}{8} + \frac{1}{8} = \frac{7}{8}$

Ex 3:

During the summer students kept track of how early they woke up. Complete the chart to create a probability distribution for what time a student might wake up on summer break.

Time to wake up	# of times recorded by students	P(x)
Before 10:00	12	0.21
Between 10:00 and 11:00	13	0.23
Between 11:00 and 12:00	15	0.26
Between 12:00 and 1:00	10	0.18
After 1:00	7	0.12

total students: 57 $\sum P(x) = 1.00$

a) What is the probability that a student wakes up before 10:00?

0.21

b) What is the probability that a student wakes up after 11:00?

$0.26 + 0.18 + 0.12 = 0.56$

Ex 5:

Use the data to construct a table and histogram showing the probability distribution of the number of cell phones per house.

X (number of cell phones)	0	1	2	3
Number of households	19	28	37	16

→ 100

x	P(x)
0	0.19
1	0.28
2	0.37
3	0.16
$\sum P(x) = 1.00$	

