Probability Tables

• While it is unlikely to work with invalid probability tables, it is important to know what makes them valid. Thus, the rules for a valid probability table are:

1) • Each of the probabilities are between 0 and 1

2 \bigcirc The sum of all probabilities is equal to 1

Practice

1. For each of the following tables, determine whether or not it is a valid probability distribution table and what rules it breaks if it is invalid. (Hint: remember the rules for probability distribution tables.)

Table A:

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ı	Χ	2	4	6	8	10	12	\bigcirc \bigcirc
	Prob.	0.09	0.45	0.2	0.06	0.11	0.21	(2) X

Spob = 0.09+0.45+..+0.21=1.12



Table B:

X	0.25	0.5	0.75	1	$\neg \circ \checkmark$
Prob.	0.07	.51	0.32	0.1	2

Sprob = 0.07+0.51+0.32+0.1=1



Invalid E

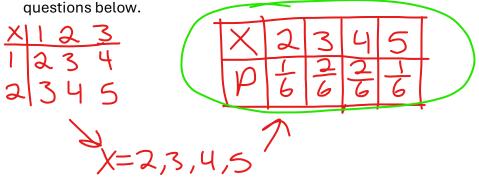
Table C:

X	0.5	1	1.5	2	2.5	3	3.5	4	$\bigcirc X$
Prob.	1.09	2.3	0.9	0.71	1.5	0.89	1.35	1.26	(3)



				~ . /
X	5	10	15	\bigcirc
Prob.	0.35	0.61	0.04	- Q V
≤ Prob. = 0.3	5+0.61+0.04=		Jalide	5

2. A group of friends are playing a betting game based off of the sum of rolling three-sided dice with a two-sided dice. Barabra wants to know the probabilities of each sum so she can bet with less risk. Create a probability table, then answer the



(A) What is the probability of more than 2 but at most 4?

(B) What is the probability of at least 3?

(C) What is the probability of less than 5?

(D) Find the mean, variance, and standard deviation of the probability table.

$$M = \sum (x_i \cdot p_i) = (2 \cdot \frac{1}{6}) + (3 \cdot \frac{2}{6}) + (4 \cdot \frac{2}{6}) + (5 + \frac{1}{6}) = 3.5$$

$$\sigma^2 = \sum (x_i^2 \cdot p_i) - M^2 = [2^2 \cdot \frac{1}{6}] + ... + (5^2 \cdot \frac{1}{6}) - 3.5^2 = 0.92$$

$$\sigma = \int \sigma^2 = \int 0.92 = 0.96$$

3. Find the missing value of the table below, then answer the questions below.

Χ	1	2	3	4	5	6	7
Prob.	0.21	0.08	0.05	0.33	?	0.03	0.16
10//) = =	(n)	$\Omega \setminus \Gamma$	(4.0).0	40.4000	4	<u> </u>	(A

(A) What is the probability of at most 2 or more than 5?

(B) What is the probability of more than 3?

(C) What is the probability of 7?

(D) Find the mean, variance, and standard deviation of the probability table.

Enter X into 4 & Prob. into L2 1-Var Stat on L1 with frequency at L2

$$M = \leq X = 3.84$$
 & $\sigma = \sigma X = 1.98$

$$\sigma^2 = (\sigma)^2 = (1.98)^2 = 3.92$$