

MPT 1: Mean, Variance, Standard Deviation

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Page 30 B

Do the following.

- Find the mean of the probability distribution of a random variable X which can take only the values of 1, 2, and 3, given that $P(1) = 10/33$, $P(2) = 1/3$, and $P(3) = 13/30$.

X	P(X)	X * P(X)
1	10/33	10/33
2	1/3	2/3 or 22/33
3	12/33	13/10
Mean		2.1

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- Find the mean of the probability distribution of a random variable X if $P(X) = 1/10$ for $X = 1, 2, 3, \dots, 10$.

X	P(X)	X * P(X)
1	1/10	0.1
2	1/10	0.2
3	1/10	0.3
4	1/10	0.4
5	1/10	0.5
6	1/10	0.6
7	1/10	0.7
8	1/10	0.8
9	1/10	0.9
10	1/10	1
Mean		5.5

Solve the following problems.

1. The probabilities of a machine manufacturing 0, 1, 2, 3, 4, or 5 defective parts in one day are 0.75, 0.17, 0.04, 0.025, 0.01, and 0.005, respectively. Find the mean of the probability distribution.

X	P(X)	X * P(X)
0	0.075	0
1	0.17	0.17
2	0.04	0.08
3	0.025	0.075
4	0.01	0.04
5	0.005	0.025
Mean		0.39

Do the following.

1. –
2. Find the variance and standard deviation of the probability distribution of a random variable X which can take only the values 3, 5, and 7, given that $P(3) = 7/30$, $P(5) = 1/3$, and $P(7) = 13/30$.

X	P(X)	X * P(X)
3	7/30	0.7
5	1/3	1.67
7	13/30	3.03
Mean		5.4
Variance		2.51
Standard Deviation		1.58

3. –
4. –
5. Find the variance and standard deviation of the probability distribution of a random variable X if $P(X) = ((x+1) / 20)$ for X = 1, 2, 3, 4, and 5.

X	P(X)	X * P(X)
1	0.1	0.1
2	0.15	0.3
3	0.2	0.6
4	0.25	1
5	0.3	1.5
Mean		3.5
Variance		1.75
Standard Deviation		1.32

Page 44 C

Solve the following problems.

1. The probabilities of a machine manufacturing 0, 1, 2, 3, 4, or 5 defective parts in one day are 0.75, 0.17, 0.04, 0.025, 0.01, and 0.005, respectively. Find the variance and standard deviation of the probability distribution.

X	P(X)	X * P(X)
0	0.75	0
1	0.17	0.17
2	0.04	0.08
3	0.025	0.075
4	0.01	0.04
5	0.005	0.025
Mean		0.39
Variance		0.69
Standard Deviation		0.83