

Questions (1-3)

Given the following discrete probability distribution:

x	3	4	5	6
f(x)=P(X=x)	0.1	0.3	0.3	k

Find:

1. The value of k .

(A) 0.1	(B) 0.2	(C) 0.3	(D) 0.4
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2. The mean of the distribution $\mu = \mu_X = E(X)$.

(A) 4.8	(B) 2.8	(C) 3.8	(D) 8.2
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3. The variance of the distribution $\sigma^2 = \sigma_X^2 = Var(X)$.

(A) 0.36	(B) 0.46	(C) 0.56	(D) 0.96
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Questions (4-8)

In a certain hospital, the medical records show that the percentage of lung cancer patients who smoke is 40%. Suppose that a doctor randomly selects a sample of 10 records of lung cancer patients from this hospital.

Find:

4. The probability that there will be no smoker in the sample.

(A) 0.009	(B) 0.106	(C) 0.006	(D) 0.306
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5. The probability that there will be 7 smokers in the sample.

(A) 0.142	(B) 0.042	(C) 0.242	(D) 0.442
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6. The probability that there will be at least 8 smokers in the sample.

(A) 0.0916	(B) 0.5016	(C) 0.1016	(D) 0.0122
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7. The probability that there will be at most 2 smokers in the sample.

(A) 0.197	(B) 0.167	(C) 0.467	(D) 0.667
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8. The variance of the number of smokers in the sample.

(A) 4.4	(B) 3.4	(C) 5.4	(D) 2.4
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Questions (9-12)

Suppose that in a certain city, the weekly number of infected cases with Corona virus (COVID-19) has a Poisson distribution with an average (mean) of 10 cases per month.

9. The probability that there will be 2 infected cases this month.

(A) 0.5023	(B) 0.0023	(C) 0.6023	(D) 0.8023
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10. The probability that there will be 3 infected case this month.

(A) 0.0075	(B) 0.9075	(C) 0.4075	(D) 0.8075
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11. The probability that there will be 100 infected case this year.

(A) 0.0068	(B) 0.0097	(C) 0.0059	(D) 0.0039
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Questions (13-17)

In a study of fingerprints, an important quantitative characteristic is the total ridge count for the 10 fingers of an individual. Suppose that the total ridge counts of individuals in a certain population are approximately normally distributed with a mean of 120 and a standard deviation of 40. Then:

12. The probability that an individual picked at random from this population will have a ridge count of 180 or more is:

(A) 0.097	(B) 0.167	(C) 0.367	(D) 0.067
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13. The probability that an individual picked at random from this population will have a ridge count of less than 80 is:

(A) 0.259	(B) 0.459	(C) 0.159	(D) 0.659
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14. The probability that an individual picked at random from this population will have a ridge count between 70 and 130 is:

(A) 0.493	(B) 0.993	(C) 0.893	(D) 0.293
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15. If we select a sample of 10,000 individuals from this population, how many individuals would be expected to have ridge counts that are between 70 and 150?

(A) 9931	(B) 5931	(C) 6677	(D) 7931
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Questions (16-19)

The mean of sodium intake in people in the U.S. population found to be 2940 mg with a standard deviation of 1476 mg. If we select a random sample of 75 people from this population then the probability that it will have a mean:

16. less than 3100 mg

(A) 0.7213	(B) 0.5721	(C) 0.1736	(D) 0.8264
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17. 2. greater than 2450 mg

(A) 0.0021	(B) 0.9979	(C) 0.0083	(D) 0.0461
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18. Between 2450 and 3100 mg

(A) 0.0895	(B) 0.4041	(C) 0.8243	(D) 0.1563
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19. greater than 2940 mg

(A) 0	(B) 0.5	(C) 0.8243	(D) 0.15
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Questions (20-23)

Given two normally distributed populations with equal means, and variances of $\sigma_1^2 = 100$ and $\sigma_2^2 = 80$. If two samples of size $n_1 = 25$ and $n_2 = 16$ are taken from the populations.

20. The mean of $\bar{x}_1 - \bar{x}_2$ is

(A) 0	(A) 9	(B) 20	(C) 1
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21. The variance of $\bar{x}_1 - \bar{x}_2$ is

(A) 0	(D) 9	(E) 20	(F) 1
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22. The probability that $\bar{x}_1 - \bar{x}_2$ is less than 8 is

(A) 0.0354	(B) 0.0038	(C) 0.9962	(D) 0.0321
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23. The probability that $\bar{x}_1 - \bar{x}_2$ is greater than 3 is

(A) 0.1587	(B) 0	(C) 0.1222	(D) 0.8413
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Questions (24-27)

In a study of a certain population, 13 percent of the patients reported previous episodes of transient ischemic attack. If 70 subjects are chosen at random from the population, then

24. The mean of the sample proportion is

(A) 0.13	(B) 0.04	(C) 0.01	(D) 0.06
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25. The standard deviation of the sample proportion is

(A) 0.13	(B) 0.04	(C) 0.01	(D) 0.06
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26. The probability that more than 10 percent would report an incidence of transient ischemic attack is

(A) 0.2266	(B) 0.5321	(C) 0.3512	(D) 0.7734
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27. The probability that between 10 and 16 percent would report an incidence of transient ischemic attack is

(A) 0.2266	(B) 0.5468	(C) 0.3512	(D) 0.7734
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Questions (28-29)

It was estimated that 21 percent of workers employed in the Northeast participated in health care benefits programs that included vision care. The percentage in the South was 13 percent. Assume these percentages are population parameters for the respective U.S. regions. Suppose we select a simple random sample of size 120 northeastern workers and an independent simple random sample of 130 southern workers.

28. The variance of $\hat{p}_1 - \hat{p}_2$ is

(A) 0.2100	(B) 0.0800	(C) 0.0500	(D) 0.0025
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29. The probability that the difference between sample proportions $\hat{p}_1 - \hat{p}_2$ is greater than 0.04

(A) 0.1865	(B) 0.7881	(C) 0.5765	(D) 0.2587
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Questions (30)

Given the t-distribution with 10 degrees of freedom, then

30. The t-value that leaves an area of 0.01 to the left is:

(A) 1.372	(B) -2.764	(C) -2.179	(D) 2.764
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