

#1 Prob & Stats – Hustle MAΘ National Convention 2025

Find the mean of the following set of data:

94, 90, 15, 51, 41, 73, 5, 35, 99, 57

Answer : _____

Round 1 2 3 4 5

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#2 Prob & Stats – Hustle

MAΘ National Convention 2025

A significance test is run at the 6% significance level. The test is designed to have a power of 69% when some particular alternative hypothesis is true. What is the probability that the test results in type 2 error given these conditions for the test. **Write your final answer with a % symbol.**

Answer : _____

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#3 Prob & Stats – Hustle

MAΘ National Convention 2025

Bill is playing catch with his son. His son catches the ball 60% of the time. Bill throws the ball to his son 5 independent times. Find the probability that his son catches the ball 2 times. **Write your answer as a simplified fraction.**

Answer : _____

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#4 Prob & Stats – Hustle

MAΘ National Convention 2025

Given the following set of 11 ordered data values:

12, 25, 33, 38, 40, 42, 46, 48, 60, 65, X

Find the maximum possible integral value of X such that X not an outlier.

Answer : _____

Round 1 2 3 4 5

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Given the following set of 11 ordered data values:

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#5 Prob & Stats – Hustle

MAΘ National Convention 2025

Suppose the scores on an Algebra test form an approximately normal distribution. Matt scores a 78 on the test and his z-score is 2.6. Ben scores a 50 on the test and his z-score is -3. Let M = the mean of the test scores and let S = the standard deviation of the test scores. Find the value of $\frac{M}{S}$.

Answer : _____

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#6 Prob & Stats – Hustle

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Suppose there is a linear relationship such that we can predict a test score from the hours of study for the test. The mean number of hours of study is 3 with a standard deviation of 1 and the mean test score is 70 with a standard deviation of 5. The correlation coefficient between hours of study and the test score is 0.64. Find the equation of the least-squares line of best fit in standard form.

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#7 Prob & Stats – Hustle

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Mr. Smith wants to know if there is a difference in the passing rate between his morning Calculus class students and his afternoon Calculus class students. He randomly samples 50 morning and 50 afternoon Calculus students. 36 of the morning students and 30 of the afternoon students passed. Find the standard error that is used to calculate the test statistic in this scenario as an exact value. Assume all conditions of the test are met.

Answer : _____

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#8 Prob & Stats – Hustle

MAΘ National Convention 2025

Stacy rolls a six-sided die 150 times. The results of the rolls are as follows:

Side	1	2	3	4	5	6
Frequency	20	28	25	30	23	24

Calculate the χ^2 test statistic used to determine if there is evidence that the die is unfair. Write your final answer as a **SIMPLIFIED FRACTION**.

Answer : _____

Round 1 2 3 4 5

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#9 Prob & Stats – Hustle

MAΘ National Convention 2025

Find the standard deviation for the following sample data set as a simplified exact value:

1, 5, 10, 20, 24

Answer : _____

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#10 Prob & Stats – Hustle MAΘ National Convention 2025

Consider the two independent random variables A and B with the following parameters:

$$\mu_A = 12 \quad \sigma_A = 4 \quad \mu_B = 80 \quad \sigma_B = 10$$

Find the standard deviation of the variable $(3A - B)$.

Answer : _____

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#11 Prob & Stats – Hustle

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Jaxson runs three races for his school: the 100, the 200 and the 400. The probability that Jaxson will win the 100 is 0.25, the probability he'll win the 200 is 0.35 and the probability he'll win the 400 is 0.5. Find the probability that Jaxson wins exactly 2 of the 3 races. Write your answer as a simplified fraction.

Answer : _____

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#12 Prob & Stats – Hustle

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Given $P(A) = 0.3$, $P(B) = 0.7$ and $P(A'|B') = \frac{2}{3}$, find the value of $P(A \cap B)$.

Answer : _____

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#13 Prob & Stats – Hustle MAΘ National Convention 2025

Find the interquartile range of the following set of 10 data values:

94, 90, 15, 51, 41, 73, 5, 35, 99, 57

Answer : _____

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#14 Prob & Stats – Hustle

MAΘ National Convention 2025

Consider the following parameters for correlated random variables X and Y along with given population least-squares regression line equation:

$$\mu_X = 16, \sigma_X = 5, \mu_Y = 60, \sigma_Y = 14, \mu_{Y|X} = 2x + 28$$

Find the coefficient of determination between random variables X and Y as a **simplified fraction**.

Answer : _____

Round 1 2 3 4 5

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#15 Prob & Stats – Hustle

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Suppose there is a linear relationship between height in inches (x) and weight in pounds (y). The regression line equation is $\hat{y} = 2x + 30$. Will is 6 feet 4 inches tall and weighs 200 pounds. Find the value of Will's residual in this scenario.

Answer : _____

Round 1 2 3 4 5

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Round 1 2 3 4 5

#16 Prob & Stats – Hustle

MAΘ National Convention 2025

	Biology	Chemistry	Physics
Spanish	32	25	18
French	26	16	8
Japanese	12	8	5

Find the expected value for French and Chemistry to help determine via chi square test of independence if there is evidence of an association between these science classes and these foreign language classes.

Answer : _____

Round 1 2 3 4 5

#16 Prob & Stats – Hustle

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	Biology	Chemistry	Physics
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	Biology	Chemistry	Physics
Spanish	32	25	18
French	26	16	8
Japanese	12	8	5

Given the two-way table above, find the probability that a randomly selected student takes Japanese, given that the student does not take Physics.

Answer : _____

Round 1 2 3 4 5

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	Biology	Chemistry	Physics
Spanish	32	25	18
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Given the two-way table above, find the probability that a randomly selected student takes Japanese, given that the student does not take Physics.

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#18 Prob & Stats – Hustle

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Kroger is trying to determine if there is evidence of a difference in the mean amount spent between morning and evening shoppers. They randomly select 100 morning and 100 evening shoppers. The mean amount spent by the morning shoppers is \$53 with a standard deviation of \$12. The mean amount spent by the evening shoppers is \$60 with a standard deviation of \$5. Find the absolute value of the test statistic used in this scenario as an exact simplified value.

Answer : _____

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#19 Prob & Stats – Hustle

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The mean of a normal distribution is 65 with a standard deviation of 10. Using the empirical percentages, find the probability of a student scoring greater than 85 or less than 35. Write your answer as a **DECIMAL**.

Answer : _____

Round 1 2 3 4 5

#19 Prob & Stats – Hustle

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The mean of a normal distribution is 65 with a standard deviation of 10. Using the empirical percentages, find the probability of a student scoring greater than 85 or less than 35. Write your answer as a **DECIMAL**.

Answer : _____

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The mean of a normal distribution is 65 with a standard deviation of 10. Using the empirical percentages, find the probability of a student scoring greater than 85 or less than 35. Write your answer as a **DECIMAL**.

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#20 Prob & Stats – Hustle

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The scores of a Statistics test have a mean of 52 and a standard deviation of 12. The test scores are linearly transformed to obtain in a new set of scores with a mean of 75 and a standard deviation of 6. Ralph scores a 60 on the test. What is Ralph's score after the transformation is applied?

Answer : _____

Round 1 2 3 4 5

#20 Prob & Stats – Hustle

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The scores of a Statistics test have a mean of 52 and a standard deviation of 12. The test scores are linearly transformed to obtain in a new set of scores with a mean of 75 and a standard deviation of 6. Ralph scores a 60 on the test. What is Ralph's score after the transformation is applied?

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##21 Prob & Stats – Hustle MAΘ National Convention 2025

Find the mean of the discrete distribution below:

X	15	20	25	30	35	40
P(X)	0.20	0.25	0.15	0.12	0.15	0.13

Answer : _____

Round 1 2 3 4 5

#21 Prob & Stats – Hustle MAΘ National Convention 2025

Find the mean of the discrete distribution below:

X	15	20	25	30	35	40
P(X)	0.20	0.25	0.15	0.12	0.15	0.13

Answer : _____

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X	15	20	25	30	35	40
P(X)	0.20	0.25	0.15	0.12	0.15	0.13

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X	15	20	25	30	35	40
P(X)	0.20	0.25	0.15	0.12	0.15	0.13

Answer : _____

Round 1 2 3 4 5

#22 Prob & Stats – Hustle

MAΘ National Convention 2025

30% of the marbles in a bag are green. Jennifer will continue to choose marbles, independently and with replacement, until she choose a green marble. Find the standard deviation of the random variable that models this situation as an exact value.

Answer : _____

Round 1 2 3 4 5

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#23 Prob & Stats – Hustle

MAΘ National Convention 2025

The probability a group of students like to swim is 80%. The probability the same group of students like to fish is 25%. Assume that swimming and fishing are independent. Find the probability that a randomly selected student from the group does not like to swim or fish. **Write your final answer as a percentage answer with a % symbol.**

Answer : _____

Round 1 2 3 4 5

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Answer : _____

Round 1 2 3 4 5

#24 Prob & Stats – Hustle

MAΘ National Convention 2025

John does a survey at the grocery store and talks to every 10th person who enters the store. What type of sample does John perform?

Answer : _____

Round 1 2 3 4 5

#24 Prob & Stats – Hustle

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John does a survey at the grocery store and talks to every 10th person who enters the store. What type of sample does John perform?

Answer : _____

Round 1 2 3 4 5

#25 Prob & Stats – Hustle MAΘ National Convention 2025

Find the median of the following set of 10 data values:

94, 90, 15, 51, 41, 73, 5, 35, 99, 57

Answer : _____

Round 1 2 3 4 5

#25 Prob & Stats – Hustle MAΘ National Convention 2025

Find the median of the following set of 10 data values:

94, 90, 15, 51, 41, 73, 5, 35, 99, 57

Answer : _____

Round 1 2 3 4 5

#25 Prob & Stats – Hustle MAΘ National Convention 2025

Find the median of the following set of 10 data values:

94, 90, 15, 51, 41, 73, 5, 35, 99, 57

Answer : _____

Round 1 2 3 4 5

#25 Prob & Stats – Hustle MAΘ National Convention 2025

Find the median of the following set of 10 data values:

94, 90, 15, 51, 41, 73, 5, 35, 99, 57

Answer : _____

Round 1 2 3 4 5