

**#1 Probability & Statistics – Hustle
MA@ National Convention 2022**

There are 25 students in Mr. Lu's Computer Science class. 6 of them are in the coding club, 5 of whom got an A on the last test. 5 of the students not in the coding club got an A as well. What is the probability that someone who received an A is in the coding club?

Answer : _____

Round 1 2 3 4 5

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**#2 Probability & Statistics – Hustle
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Ethan Penguin consistently visits the same tourist spot for food handouts and always leaves satisfied, meaning he's always successful in charming people for food. Ethan is an example of:

- A. High variability, low bias
- B. Low variability, low bias
- C. High variability, high bias
- D. Low variability, high bias

Give the correct letter.

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**#3 Probability & Statistics – Hustle
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How many distinct permutations of the letters in the word NATIONALS are there?

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**#4 Probability & Statistics – Hustle
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Given $P(A) = .5$, $P(B) = .6$, and events A and B are independent, find the value of:

$$P(A \cup B) - P(A' \cap B')$$

Answer : _____

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**#5 Probability & Statistics – Hustle
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Ethan is trying to teach Will how to solo a boss in Maplestory. On any given run, there is a 20% chance that Will will pass the trial. Given that Ethan continue to teach Will until he passes, what is the probability that he teaches Will for exactly 3 runs?

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**#6 Probability & Statistics – Hustle
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Find the expected value of this distribution to the nearest whole number:

X	5	10	15	20
P(X)	0.5	0.2	0.1	0.2

Answer : _____

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A two proportion, two-sided significance test is performed to compare effectiveness of sleep medications. Researchers want to increase the power of the test and decide to use an $\alpha = 0.15$ level of significance instead of the standard $\alpha = 0.05$. What is the probability of a Type I error in this experiment?

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**#8 Probability & Statistics – Hustle
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Caroline gives a Statistics test. The results form a normal distribution with mean 78 and standard deviation 5. Annie scored a 66 on the test and Bahar scored a 94. Find the positive difference between Annie's and Bahar's z scores.

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**#9 Probability & Statistics – Hustle
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Find the interquartile range of the following set of data:

{8,10,22,14,29,5,30,20,17,13}

Answer : _____

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Chris wants to survey customers at Gamestop. He gives every customer in the store a survey, but several decline to fill it out. This is an example of what kind of bias?

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**#11 Probability & Statistics – Hustle
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The following regression line is used to model the linear relationship between the number of pet adoptions and number of web ads put out, where x is the number of web ads and y is the number of pet adoptions. Use this line to determine the residual value at the point (3, 22)

$$\hat{y} = -2.5 + 9x$$

Answer : _____

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**#12 Probability & Statistics – Hustle
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Find the standard deviation of the following set of randomly selected data:

2, 3, 4, 7, 8, 12

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**#13 Probability & Statistics – Hustle
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How many of the following are nonresistant measures?

Mean, Mode, Median, Range, Standard Deviation

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**#14 Probability & Statistics – Hustle
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A council is looking to fill a jury. The probability that a randomly selected person is suitable to be on the jury is .07, and there are 12 such jobs to fill. Compute the ceiling of the number of people the council expect to look through until all positions are filled?

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**#15 Probability & Statistics – Hustle
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Given the sets X and Y where $\bar{x} = 32$, $s_x = 8$, $\bar{y} = 12$, $s_y = 3$, and $r = .76$, find the standard deviation of the set $(X - Y)$. X and Y are both random variables.

Answer : _____

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**#16 Probability & Statistics – Hustle
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A binomial distribution with $n=15$ is _____
when p is considerably smaller than 0.5, but it
becomes more _____ as p approaches 0.5.

- A) Skewed left, symmetric
- B) Skewed right, symmetric
- C) Skewed left, skewed right
- D) Skewed right, skewed left

Give the letter of the correct answer.

Answer : _____

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**#17 Probability & Statistics – Hustle
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Alk and Duke make a bet. The odds against Alk winning the bet is 11:7. What is the probability of Alk winning?

Answer : _____

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**#18 Probability & Statistics – Hustle
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There appears to be a relationship between a college student's entrance exam rank and their GPA. As the student's rank went up, so did his or her GPA. Is the relationship between these two variables causation, confounding, common response, or coincidence?

Answer : _____

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**#19 Probability & Statistics – Hustle
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A study was recently conducted to see how much male and female high school seniors studied in a given week.

	<2 hrs	2-6 hrs	6+ hours
Male	29	50	5
Female	30	84	11

Find $P(\text{Male} \mid < 2 \text{ hr})$.

Answer : _____

Round 1 2 3 4 5

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**#20 Probability & Statistics – Hustle
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The non-zero part of a density function consists solely of a line segment that begins at the origin and has a slope of 1. Find the x-coordinate of the right endpoint of the segment.

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Robin is rolling a 6-sided die, which is rigged so that prime numbers have double the probability of showing up over the other numbers. Find the probability that at least one prime number is rolled out of three rolls.

Answer : _____

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Jelly loves baking! 70% of the cookies she makes are perfect in every way. Every day, Jelly makes 100 cookies. Assuming the outcome of each cookie is independent, find the standard deviation of the number of perfect cookies Jelly makes every day.

Answer : _____

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**#23 Probability & Statistics – Hustle
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How many degrees of freedom would a chi-squared test examining the relationship between education {Some High School, High School Graduate, Some College, College Graduate} and Gender {Male, Female} have?

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**#24 Probability & Statistics – Hustle
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Find the width of the 95% confidence interval,
rounded to the nearest whole number:

$$\begin{aligned}\bar{x} &= 32 \\ \sigma &= 14 \\ n &= 36\end{aligned}$$

Answer : _____

Round 1 2 3 4 5

**#24 Probability & Statistics – Hustle
MA@ National Convention 2022**

Find the width of the 95% confidence interval,
rounded to the nearest whole number:

$$\begin{aligned}\bar{x} &= 32 \\ \sigma &= 14 \\ n &= 36\end{aligned}$$

Answer : _____

Round 1 2 3 4 5

**#24 Probability & Statistics – Hustle
MA@ National Convention 2022**

Find the width of the 95% confidence interval,
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Round 1 2 3 4 5

**#24 Probability & Statistics – Hustle
MA@ National Convention 2022**

Find the width of the 95% confidence interval,
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$$\begin{aligned}\bar{x} &= 32 \\ \sigma &= 14 \\ n &= 36\end{aligned}$$

Answer : _____

Round 1 2 3 4 5

**#25 Probability & Statistics – Hustle
MA@ National Convention 2022**

A sample data set has a coefficient of determination of 76%. Find the least possible correlation between the data.

Answer : _____

Round 1 2 3 4 5

**#25 Probability & Statistics – Hustle
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