Probability/Statistics

Probability vs Likelihood
https://www.quora.com/What-is-the-difference-between-probability-and-likelihood-1#

Expected number of observations from Uniform(0,1) until the sum of all observations exceeds 1
https://math.stackexchange.com/q/111314/599868

Uncorrelated but dependent random variables
https://stats.stackexchange.com/questions/85363/simple-examples-of-uncorrelated-but-not-independent-x-and-y

What are the bounds of the pairwise correlations between three random variables? (asked in my MIT interview)
https://math.stackexchange.com/questions/284877/correlation-between-three-variables-question

A data science manager is super wrong
https://stats.stackexchange.com/questions/185507/what-happens-if-the-explanatory-and-response-variables-are-sorted-independently

Derivation of mean and variance of the hypergeometric distribution
https://math.stackexchange.com/questions/1380460/derivation-of-mean-and-variance-of-hypergeometric-distribution

Why keep training batch sizes in terms of powers of 2?
https://datascience.stackexchange.com/a/20193

What's the difference between correlation and regression slope?
https://stats.stackexchange.com/questions/2125/whats-the-difference-between-correlation-and-simple-linear-regression

Independence vs Conditional Independence of random variables:
https://math.stackexchange.com/questions/22407/independence-and-conditional-independence-between-random-variables

Amazing explanation of Principal Component Analysis:
https://stats.stackexchange.com/questions/2691/making-sense-of-principal-component-analysis-eigenvectors-eigenvalues

Difference between probability and likelihood:
https://stats.stackexchange.com/questions/2641/what-is-the-difference-between-likelihood-and-probability

Sum of random variables is not the same as constant multiples of random variables (X+X \neq 2X)
https://stats.stackexchange.com/questions/235678/why-is-x-x-2x-but-x-x-neq-2x
Feature selection in ridge regression vs lasso regression
https://stats.stackexchange.com/questions/176599/why-will-ridge-regression-not-shrink-some-coefficients-to-zero-like-lasso

Sum of squared error in Gaussian noise
https://stats.stackexchange.com/questions/80424/sum-of-squared-difference-and-gaussian-noise-model/

KNN to cluster stocks by correlation
https://quant.stackexchange.com/questions/2263/how-to-cluster-stocks-and-construct-an-affinity-matrix

Testing a biased coin
https://math.stackexchange.com/questions/1689448/statistical-testing-of-a-biased-coin

Prior distribution changes the frequentist answer
https://math.stackexchange.com/questions/1114093/why-would-a-uniform-prior-distribution-give-a-different-result-than-a-purely-fre

Significance of the Sharpe ratio
https://stats.stackexchange.com/questions/155223/testing-sharpe-ratio-significance

Uniform distribution over a disk
https://math.stackexchange.com/questions/927347/uniform-distribution-over-disk

Probability that broken stick forms an n-gon
https://math.stackexchange.com/questions/2848881/the-probability-of-those-n-broken-parts-of-sticks-to-form-a-closed-polygon

Expected ratio of coin flips
https://math.stackexchange.com/questions/140184/expected-ratio-of-coin-flips

Unexpected uniform distribution result
https://math.stackexchange.com/questions/493017/if-x-y-z-are-iid-unif0-1-then-xyz-sim-textunif0-1

Conditional distributions of multivariate normal

https://stats.stackexchange.com/questions/303720/how-to-sample-a-slice-of-a-multivariate-normal-distribution

Likelihood ratio vs Bayes factor
https://stats.stackexchange.com/questions/27345/likelihood-ratio-vs-bayes-factor

Coin flipping optimal stoppage
https://math.stackexchange.com/questions/6195/why-is-this-coin-flipping-probability-problem-unsolved

Why is it called the hypergeometric distribution?
https://stats.stackexchange.com/questions/90605/why-are-the-geometric-distribution-and-hypergeometric-distribution-called-as-suc

Probability of a team winning a single elimination bracket given matrix of pairwise win probabilities
https://math.stackexchange.com/questions/819314/probability-of-team-winning-in-a-single-elimination-tournament

Checking fairness of a coin
https://stats.stackexchange.com/questions/171451/check-whether-a-coin-is-fair

https://stats.stackexchange.com/questions/364003/testing-if-a-coin-is-fair-using-bayesian-statistics

Number Theory

Crazy elliptic curve problem:
https://www.quora.com/How-do-you-find-the-positive-integer-solutions-to-frac-x-y+z-+-frac-y-z+x-+-frac-z-x+y-4

Bounds on the number of prime factors of an integer:
https://math.stackexchange.com/questions/409675/number-of-distinct-prime-factors-omegan

Growth of the least common multiple of natural numbers
https://mathoverflow.net/questions/217845/asymptotics-of-the-least-common-multiple-of-the-first-natural-numbers

Another post on growth of the least common multiple of natural numbers
https://math.stackexchange.com/questions/834220/least-common-multiple-lim-sqrtn1-2-dotsc-n-e

Exponents cycle mod n

https://math.stackexchange.com/questions/1159995/do-the-last-digits-of-exponential-towers-really-converge-to-a-fixed-sequence

9801 is cool
https://math.stackexchange.com/questions/102682/what-is-special-about-the-numbers-9801-998001-99980001

Least prime factor counterexample
https://math.stackexchange.com/questions/3305125/is-it-true-that-for-any-two-integers-with-the-same-least-prime-factor-there-mus/3459621#3459621
GCD strikes back
https://crypto.stackexchange.com/questions/76757/the-gcd-strikes-back-to-rsa-in-2019-good-randomness-is-the-only-solution

Algebra

Function from naturals to naturals such that f(f(n))=n+1987, IMO 1987 #4
https://math.stackexchange.com/q/325504/599868

Function from naturals to naturals such that f(f(n))=n+2015
https://math.stackexchange.com/questions/1086891/functions-such-that-ffn-n2015

A continued fraction somehow becomes complex (a+bi)
https://math.stackexchange.com/questions/1681993/why-is-1-frac11-frac11-ldots-not-real

Stupidly crazy behavior of a seemingly simple sum
https://www.quora.com/Is-the-sequence-x_n-sum_-k-1-n-tan-k-bounded/answer/Alon-Amit?ch=10&share=ca7f2ad8&srid=OWXc

Is there a function such that f(f(x))=e^x?
https://mathoverflow.net/questions/12081/does-the-exponential-function-have-a-compositional-square-root

Where do complex numbers arise naturally?
https://math.stackexchange.com/questions/3244132/what-is-a-simple-physical-situation-where-complex-numbers-emerge-naturally

The generalized discriminant
https://math.stackexchange.com/questions/1405365/express-roots-in-polynomials-of-equation-x3x2-2x-1-0

Roots of polynomials have absolute value close to 1
https://mathoverflow.net/questions/182412/why-do-roots-of-polynomials-tend-to-have-absolute-value-close-to-1/182637#182637

Interesting groups
https://math.stackexchange.com/questions/362446/nice-examples-of-groups-which-are-not-obviously-groups

Calculus/Analysis

Ron Gordon's insane integral
https://math.stackexchange.com/questions/562694/integral-int-11-frac1x-sqrt-frac1x1-x-ln-left-frac2-x22-x1

When the +C after integration can be misleading
https://www.reddit.com/r/math/comments/9148nl/a_while_back_i_had_to_write_some_alevel_calculus

Useful integration techniques
https://math.stackexchange.com/questions/942263/really-advanced-techniques-of-integration-definite-or-indefinite

What even is dx? What is an infinitesimal?
https://math.blogoverflow.com/2014/11/03/more-than-infinitesimal-what-is-dx/

Explanation of dy/dx (it's not a fraction even though it acts like one!)
https://math.stackexchange.com/questions/21199/is-frac-textrmdy-textrmdx-not-a-ratio

Rigorous definition of dx and dy
https://math.stackexchange.com/questions/2865808/what-is-the-rigorous-definition-of-dy-and-dx/2865869

What even is a differential?
https://math.stackexchange.com/questions/23902/what-is-the-practical-difference-between-a-differential-and-a-derivative

Checklist for Multivariable Limits

https://math.stackexchange.com/questions/316806/is-there-a-step-by-step-checklist-to-check-if-a-multivariable-limit-exists-and-f

Many cool approaches to the Basel problem (sum of squared reciprocals)
https://math.stackexchange.com/questions/8337/different-methods-to-compute-sum-limits-k-1-infty-frac1k2-basel-pro

Wadim Zudilin versus a crazy convergence
https://mathoverflow.net/questions/24579/convergence-of-sumn3-sin2n-1

Limit of truncated sums of the harmonic series
https://math.stackexchange.com/questions/73550/the-limit-of-truncated-sums-of-harmonic-series-lim-limits-k-to-infty-sum-n

Estimate ln(3)
https://math.stackexchange.com/questions/1179348/estimate-ln3-using-taylor-expansion-up-to-3rd-order

A baby Rudin example
https://math.stackexchange.com/questions/141774/choice-of-q-in-baby-rudins-example-1-1

Interpretation of u-substitution
https://math.stackexchange.com/questions/737928/the-formalism-behind-integration-by-substitution

XKCD convergence
https://math.stackexchange.com/questions/4057261/for-what-values-does-the-geothmetic-meandian-converge

Irrational numbers in finitism
https://mathoverflow.net/questions/102237/what-is-the-status-of-irrational-numbers-within-finitism-ultrafinitism

Integration is hard
https://math.stackexchange.com/questions/680478/list-of-functions-not-integrable-in-elementary-terms

Linear Algebra

What even is the determinant of a matrix?
https://math.stackexchange.com/questions/668/whats-an-intuitive-way-to-think-about-the-determinant

What even is the transpose of a matrix?
https://math.stackexchange.com/questions/37398/what-is-the-geometric-interpretation-of-the-transpose?newreg=660b15107f1e4c69bd34078968ee1e86

Determinant and eigenvalues of a matrix with same value on the diagonal and different same value everywhere else
https://math.stackexchange.com/questions/86644/determinant-of-a-specially-structured-matrix-as-on-the-diagonal-all-other-e

Another determinant problem where the diagonal is all n's and everything else is 1
https://math.stackexchange.com/questions/175228/suppose-a-is-an-n-by-n-matrix-with-its-diagonal-entries-are-n-and-other-entries

The product of two symmetric, positive semidefinite matrices has non-negative eigenvalues
https://math.stackexchange.com/questions/982797/the-product-of-two-symmetric-positive-semidefinite-matrices-has-non-negative-ei

Brainteasers/Misc.

Finding 2 poisoned bottles out of 1000
https://math.stackexchange.com/q/102958/599868

Amazing visualizations of several math concepts
https://math.stackexchange.com/questions/733754/visually-stunning-math-concepts-which-are-easy-to-explain

Can three people devise a way to cut a sandwich and choose pieces fairly?
https://math.stackexchange.com/questions/637728/splitting-a-sandwich-and-not-feeling-deceived

Is pi a normal number? Is it disjunctive? That is, are its digits "random"?
https://math.stackexchange.com/questions/216343/does-pi-contain-all-possible-number-combinations

Mathematical difference between white and black notes on a piano
https://math.stackexchange.com/questions/11669/mathematical-difference-between-white-and-black-notes-in-a-piano

Covering N points with 3 squares of minimum length
https://stackoverflow.com/questions/33478697/covering-n-points-with-three-squares-of-minimum-length

Mic drop moments in math:
https://mathoverflow.net/q/325105

Crazy proof that sqrt(2) is irrational
https://math.stackexchange.com/questions/141774/choice-of-q-in-baby-rudins-example-1-1

Birthday problem for triples
https://math.stackexchange.com/questions/25876/probability-of-3-people-in-a-room-of-30-having-the-same-birthday

More birthday problem for triples
https://math.stackexchange.com/questions/485462/birthday-problem-for-3-people

Problem of ants on a string
https://math.stackexchange.com/questions/1036902/interesting-question-on-ants

Another problem of ants on a string
https://math.stackexchange.com/questions/1418351/random-ants-probability-question

Lion and sheep problem
https://math.stackexchange.com/questions/937410/understanding-the-solution-of-a-riddle-about-lions-and-sheep

Expected number of draws from a deck before an ace
https://math.stackexchange.com/questions/1138853/expected-number-of-cards-you-should-turn-before-finding-an-ace

Lesser-known math tricks
https://www.quora.com/Whats-a-math-trick-that-is-not-very-well-known

Math urban legends
https://mathoverflow.net/questions/53122/mathematical-urban-legends/

Godel's compactness theorem to solve a geometry problem
https://math.stackexchange.com/questions/4019097/if-a-subset-of-the-square-grid-can-be-tiled-by-1-times-n-rectangles-for-every

Conjectures with extremely large counterexamples
https://math.stackexchange.com/questions/514/conjectures-that-have-been-disproved-with-extremely-large-counterexamples

Eventual counterexamples
https://mathoverflow.net/questions/15444/examples-of-eventual-counterexamples

Colorful language in papers
https://mathoverflow.net/questions/22299/what-are-some-examples-of-colorful-language-in-serious-mathematics-papers

Lanchester's laws in RTS games
https://www.quora.com/Have-you-ever-used-higher-mathematics-in-your-daily-life

April Fools math
https://mathoverflow.net/questions/235008/examples-of-math-hoaxes-interesting-jokes-published-on-april-fools-day

Thue-Morse Sequence for balance coffee pours
https://www.reddit.com/r/math/comments/nqffrr/whats_the_dumbest_application_for_an_advanced/

Induction when the base case is hard
https://math.stackexchange.com/questions/43007/what-are-some-examples-of-induction-where-the-base-case-is-difficult-but-the-ind

Canonical short exact sequences
https://www.reddit.com/r/math/comments/ol84jj/short_exact_sequences_every_mathematician_should

Geometry problems with seemingly not enough information

https://www.reddit.com/r/math/comments/otluid/geometry_problems_with_seemingly_not_enough/?utm_medium=android_app&utm_source=share

Programming/CompSci

What color is chuck norris?
https://stackoverflow.com/questions/8318911/why-does-html-think-chucknorris-is-a-color?fbclid=IwAR3gH8Qcbj8rqxOFmX8zqBTvpYIyHW1NfuTMoEJnmonfDgX59M2oIOEcHFs

Python String Slicing Methods:
https://stackoverflow.com/questions/21617586/reverse-string-string-1-works-but-string0-1-and-others-dont

Fastest integer factorization algos:
https://stackoverflow.com/questions/2267146/what-is-the-fastest-factorization-algorithm

Recursion, Memoization, and Dynamic Programming:
https://stackoverflow.com/questions/12133754/whats-the-difference-between-recursion-memoization-dynamic-programming

Is a hash a zero knowledge proof?
https://crypto.stackexchange.com/questions/70877/is-a-hash-a-zero-knowledge-proof

Reverse digits of an integer
https://math.stackexchange.com/questions/472981/formula-for-reversing-digits-of-positive-integer-n

There's no simple way to find the largest circle that will fit in an irregular polygon
https://stackoverflow.com/questions/4279478/largest-circle-inside-a-non-convex-polygon

Integer partition algorithm
https://stackoverflow.com/questions/14053885/integer-partition-algorithm-and-recursion

Knight’s tour as a neural network
https://math.stackexchange.com/questions/87991/knights-tour-as-a-neural-network

Given a dictionary of words and a string, generate all valid anagrams

https://stackoverflow.com/questions/20680145/best-algorithm-to-find-anagram-of-word-from-dictonary

Another post on generating valid anagrams
https://stackoverflow.com/questions/25298200/given-a-dictionary-and-a-list-of-letters-find-all-valid-words-that-can-be-built

Guessing the smallest unique positive integer
https://cs.stackexchange.com/questions/13061/guessing-the-smallest-unique-positive-integer