**Maths (Advocate: Thiago Viana)**

**Calculate the greatest common divisor and least common multiple of a given pair of numbers.**

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| <https://github.com/LBruni98/Mathematics#how-to-calculate-the-greatest-common-divisor-and-least-a-common-multiple-of-a-given-pair-of-numbers> |
| The link above leads the user to a repo entirely on mathematics. The criterion falls under the heading “Probability Theory”, with a section on both GCDs and LCMs. It describes what both GCDs and LCMs and describes the process in finding them, along with examples. |

**Use relevant theory to sum arithmetic and geometric progressions.**

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| <https://github.com/LBruni98/Maths-Code-Samples/blob/master/README.md#arithmetic-and-geometric-progressions>  <https://github.com/LBruni98/Maths-Code-Samples/blob/master/Code/Arithmetic%20and%20Geometric%20Progressions.cpp> |
| The links above takes the user to a separate repo on math code. The top link leads to the README document showcasing the code and second link leads the user to the code file. The code is written in a high-level programming language, C++ and function to sum these progressions. The code can be run in any IDE supporting C++. |

**Deduce the conditional probability of different events occurring within independent trials.**

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| <https://github.com/LBruni98/Mathematics#probability-theory> |
| The link above leads the user to a repo entirely on mathematics. The criterion falls under the heading “Probability Theory”, with a section showing how probability of a certain number can be calculated. |

**Identify the expectation of an event occurring from a discrete, random variable.**

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| <https://github.com/LBruni98/Mathematics#the-probability-of-a-random-integer-being-divisible-by-5> |
| Above contains the repo entirely on mathematics. Under the section “Probability Theory is where the criterion is. The section shows the probability of a random integer being divisible by 5, with how the probability for said integer being that of 1/5. |

**Identify simple shapes using co-ordinate geometry.**

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| <https://github.com/LBruni98/Maths-Code-Samples/blob/master/README.md#shape-co-ordinates>  <https://github.com/LBruni98/Maths-Code-Samples/blob/master/Code/Shape%20Co-ordinates.cpp> |
| Two links contain the evidence that I think is suitable. The links lead to the repo to the math code and the code file itself. The links show the code, written in C++, about identifying simple shapes, where the user inputs up to four coordinates which could result in either a square, rectangle or triangle. The code can be run in any IDE supporting C++. |

**Determine shape parameters using appropriate vector methods.**

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**Determine the rate of change within an algebraic function.**

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| To be completed |
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**Use integral calculus to solve practical problems involving area.**

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**Identify multiplicative inverses in modular arithmetic.**

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| To be completed |
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**Calculate probabilities within both binomially distributed and normally distributed random variables.**

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| To be completed |
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**Evaluate the coordinate system used in programming a simple output device.**

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| <https://github.com/LBruni98/Trace-Ball#retrieving-mouse-co-ordinates> |
| The link above takes the user to a micro project repo, called “Trace Ball”. The README document goes more in depth about how the coordinate system was used. Describing it, the project asks for the mouse to follow a shape, which is to be the game’s “cursor” and a shape trailing behind the cursor, which is supposed to be the enemy. The game uses the mouse coordinates where they are taken and used to create the cursor and the enemy’s movements. |

**Analyse maxima and minima of increasing and decreasing functions using higher order derivatives.**

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**Produce a detailed written explanation of the importance of prime numbers within the field of computing.**

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| To be completed |
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**Evaluate probability theory to an example involving hashing and load balancing.**

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| To be completed |
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**Construct the scaling of simple shapes that are described by vector coordinates.**

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| To be completed |
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**Justify, by further differentiation, that a value is a minimum.**

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| To be completed |
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