Find the sum of the coefficients of the polynomial obtained after expanding and collecting the terms of the product:

$$(1 - 3x + 3x^2)^{743}(1 + 3x - 3x^2)^{744}$$

SUBMIT ANSWER *and proceed to next question*

You roll two dice.

What is the probability the difference between the high and low roll is exactly 4, to four decimal places?

SUBMIT ANSWER *and proceed to next question*

PREVIOUS

Suppose there is an asset X whose current value is \$90, and we know its value in one year will be \$100. There is an option that pays \$1 when X hits \$97 for the first time.

Compute the value of this option to 4 decimal places.

SUBMIT ANSWER *and proceed to next question*

PREVIOUS

Let X and Y be two standard independent normal variables, i.e., X ~ N(0,1), Y ~ N(0,1), and ρ(X,Y) = -0.72.

Calculate $E[3X+Y|X-Y=1]$

SUBMIT ANSWER *and proceed to next question*

PREVIOUS

(Part 1 of 2) - Students from two schools participated in a tournament. Each contestant played each other contestant once. There were ten times as many students from school A but they were able to win only 4.5 times as many points as the students from school B.

a) How many students from school B participated?

SUBMIT ANSWER *and proceed to next question*

PREVIOUS

(Part 2 of 2) - Students from two schools participated in a tournament. Each contestant played each other contestant once. There were ten times as many students from school A but they were able to win only 4.5 times as many points as the students from school B.

b) How many points did they win?

SUBMIT ANSWER *and proceed to next question*

PREVIOUS

Suppose the current price of a stock is $100. The price has probability 70% of increasing to $110 and probability 30% of declining to $90 in one year. Assume the risk-free rate is 5%.

Calculate the value of a call option struck at $100 that matures in one year to four decimal places.

SUBMIT ANSWER *and proceed to next question*

PREVIOUS

Suppose X, and Y are independent Brownian Motions that at time 0 are both equal to 1. Consider the first time, T, the Y process hits 0.

What is the probability that $X(T) > 0$?

SUBMIT ANSWER *and proceed to next question*

PREVIOUS

A player A tosses 100 coins. B tosses 99 coins. B wins if he has at least as many heads as A.

What is the probability that B wins?

SUBMIT ANSWER *and proceed to next question*

PREVIOUS

The number 123456789(10)(11)(12)(13)(14) is written in the base 15, that is the number is equal (in the base 10) to

$$14 + 13*15 + 12*15^2 + 11*15^3 + \ldots + 2*15^{12} + 15^{13}$$

Without using computers, calculators or other computation devices, calculate the remainder upon dividing this number by 7.

SUBMIT ANSWER *and proceed to next question*

PREVIOUS

There is a 6-faced fair die.

What is the expected number of throws before getting three same numbers in a row?

SUBMIT ANSWER *and proceed to next question*

PREVIOUS

The population of an endangered species at year N is denoted by

$$P_N$$

Assume

$$P_0 = 100$$

P updates by the rule

$$P_{n+1} = 2 * P_n$$

with probability 1/2

,

$$P_{n+1} = 0$$

with probability 1/2.

What is the expected time until the species dies out?

SUBMIT ANSWER *and proceed to next question*

PREVIOUS

A family has two children. The genders of the first-born and second-born are independent (with boy and girl equally likely). The seasons in which the children were born in are independent, with all 4 seasons (winter, spring, summer, fall) equally likely.

Find the probability to 4 decimal places that both children are girls, given that at least one of the two is a girl who was born in winter.

SUBMIT ANSWER *and proceed to next question*

PREVIOUS

Without using computers, calculators or other computation devices, find the integer part of X (i.e. [X]) where X is given by the following sum:

$$X = \sum_{i=4}^{1,000,000} \frac{1}{\sqrt[3]{i}}$$

SUBMIT ANSWER *and proceed to next question*

PREVIOUS

(Part 1 of 2) - There are 3 random variables X, Y and Z. The correlation between X and Y is 0.8 and correlation between X and Z is 0.5.

Calculate the minimum correlation between Y and Z, to four decimal places.

SUBMIT ANSWER *and proceed to next question*

PREVIOUS

(Part 2 of 2) - There are 3 random variables X, Y and Z. The correlation between X and Y is 0.8 and correlation between X and Z is 0.5.

Calculate the maximum correlation between Y and Z, to four decimal places.

SUBMIT ANSWER *(Last question! Answering this will complete the challenge.)*

PREVIOUS