Assessment due May 31, 2021 09:49 +03

A casino offers a House Special bet on roulette, which is a bet on five pockets (00, 0, 1, 2, 3) out of 38 total pockets. The bet pays out 6 to 1. In other words, a losing bet yields -$1 and a successful bet yields $6. A gambler wants to know the chance of losing money if he places 500 bets on the roulette House Special.

The following 7-part question asks you to do some calculations related to this scenario.

Question 3a

0/1 point (graded)

What is the expected value of the payout for one bet?

12 ✖ **Answer:** -0.0789

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Explanation

The expected value can be calculated using the following code:

```
p <- 5/38
a <- 6
b <- -1
mu <- a*p + b*(1-p)
mu
```

Submit You have used 10 of 10 attempts

Answers are displayed within the problem

Question 3b

0/1 point (graded)

What is the standard error of the payout for one bet?

121 ✖ **Answer:** 2.37

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Explanation

The standard error can be calculated using the following code:

```
            sigma <- abs(b-a) * sqrt(p*(1-p))
sigma
```

Submit You have used 10 of 10 attempts

Answers are displayed within the problem

Question 3c

0/1 point (graded)

What is the expected value of the average payout over 500 bets?

Remember there is a difference between expected value of the average and expected value of the sum.

212 ✖ **Answer:** -0.0789

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Explanation

The expected value can be calculated using the following code:

```
mu
```

Submit You have used 10 of 10 attempts

Answers are displayed within the problem

Question 3d

0/1 point (graded)

What is the standard error of the average payout over 500 bets?

Remember there is a difference between the standard error of the average and standard error of the sum.

1121 ✖ **Answer:** 0.106

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Explanation

The standard error can be calculated using the following code:

```
n <- 500
sigma/sqrt(n)
```

Submit You have used 10 of 10 attempts

Answers are displayed within the problem

Question 3e

0/1 point (graded)

What is the expected value of the sum of 500 bets?

122 ✖ **Answer:** -39.5

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Explanation

The expected value can be calculated using the following code:

```
n*mu
```

Submit You have used 10 of 10 attempts

Answers are displayed within the problem

Question 3f

0/1 point (graded)

What is the standard error of the sum of 500 bets?

121 ✖ **Answer:** 52.9

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Explanation

The standard error can be calculated using the following code:

```
sqrt(n) * sigma
```

Submit You have used 10 of 10 attempts

Answers are displayed within the problem

Question 3g

0/1 point (graded)

Use `pnorm()` with the expected value of the sum and standard error of the sum to calculate the probability of losing money over 500 bets, \(\mbox{Pr}(X \leq 0) \).

121 ✖ **Answer:** 0.772

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Explanation

The standard error can be calculated using the following code:

```
pnorm(0, n*mu, sqrt(n)*sigma)
```

Submit

You have used 10 of 10 attempts

Answers are displayed within the problem