R University

Exam 2015-07-29

Personal Data

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1	☐	☐	☐	☐	☐	☐	☐	1
2	☐	☐	☐	☐	☐	☐	☐	2
3	☐	☐	☐	☐	☐	☐	☐	3
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5	☐	☐	☐	☐	☐	☐	☐	5
6	☐	☐	☐	☐	☐	☐	☐	6
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8	☐	☐	☐	☐	☐	☐	☐	8
9	☐	☐	☐	☐	☐	☐	☐	9

In this section **no** changes or modifications must be made!

Scrambling 0 0

Type: 010

Exam ID: 15072900002

Please mark the boxes carefully: ☒ Not marked: ☐ or ■

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Only clearly marked and positionally accurate crosses will be processed!

Answers 1 - 6

	a	b	c	d	e
1					
2					
3	☐	☐	☐	☐	☐
4	☐	☐	☐	☐	☐
5	☐	☐	☐	☐	☐
6					
	a	b	c	d	e

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In this section **no** changes or modifications must be made!

Type	Exam ID
999	15072900002

1 ☐ ☐ ☐ ☐ ☐
2 ☐ ☐ ☐ ☐ ☐
6 ☐ ☐ ☐ ☐ ☐

In the following please fill in your answers.

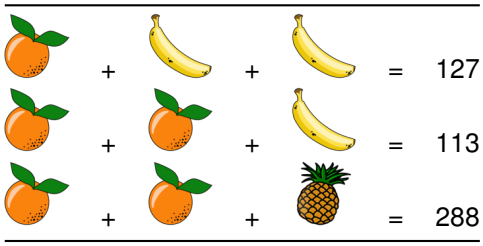
1

2

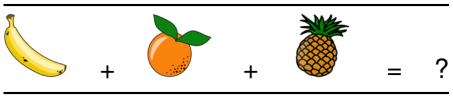
6

1. *(1 point)* What is the derivative of $f(x) = x^9 e^{2.6x}$, evaluated at $x = 0.5$?

2. *(1 point)* Given the following information:



   Compute:



3. *(1 point)* A machine fills milk into 1000ml packages. It is suspected that the machine is not working correctly and that the amount of milk filled differs from the setpoint $\mu_0 = 1000$. A sample of 176 packages filled by the machine are collected. The sample mean $\bar{y}$ is equal to 983.4 and the sample variance s^2_{n-1} is equal to 2939.82.

   Test the hypothesis that the amount filled corresponds on average to the setpoint. What is the value of the t test statistic?

   (a) 59.802
   (b) 65.873
   (c) -4.062
   (d) 32.290
   (e) -68.232

4. *(2 points)* The waiting time (in minutes) at the cashier of two supermarket chains with different cashier systems is compared. The following statistical test was performed:

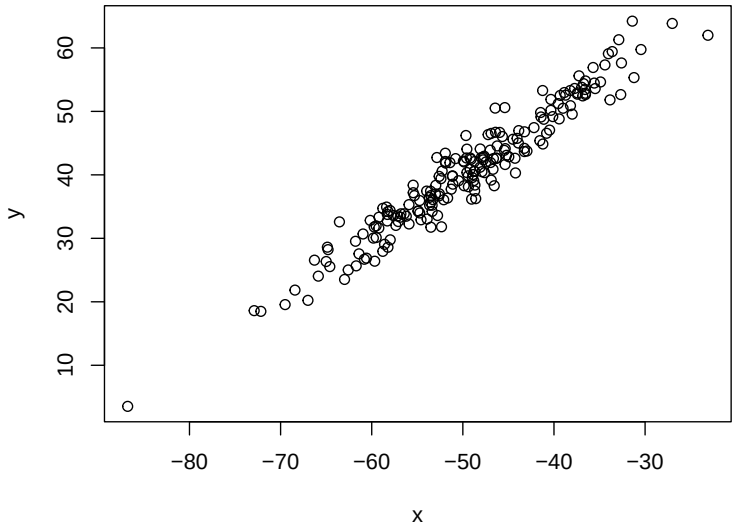
```
        Two Sample t-test

data:  Waiting by Supermarket
t = 0.016793, df = 111, p-value = 0.4933
alternative hypothesis: true difference in means between group Sparag and group Consumo is great
95 percent confidence interval:
 -1.013614       Inf
sample estimates:
 mean in group Sparag mean in group Consumo
             6.143942              6.133575
```

   Which of the following statements are correct? (Significance level 5%)

   (a) The absolute value of the test statistic is larger than 1.96.
   (b) A one-sided alternative was tested.
   (c) The p value is larger than 0.05.
   (d) The test shows that the waiting time is longer at Sparag than at Consumo.
   (e) The test shows that the waiting time is shorter at Sparag than at Consumo.

5. *(2 points)* The following figure shows a scatterplot. Which of the following statements are correct?



   (a) The absolute value of the correlation coefficient is at least 0.8.
   (b) For $X = -49.2$, Y can be expected to be about 40.8 .
   (c) The scatterplot is standardized.
   (d) The mean of Y is at least 30.
   (e) The standard deviation of X is at least 6.

6. *(3 points)* What is the name of the R function for extracting the estimated covariance matrix from a fitted (generalized) linear model object?