R University

Exam 2015-07-29

Personal Data

Family Name:

Given Name:

Signature:

checked

Registration Number

0 1 2 3 4 5 6 7 8 9

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

Scrambling

0 0

Type: 010

Exam ID: 15072900005

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

This document is scanned automatically. Please keep clean and do not bend or fold. For filling in the document please use a **blue or black pen**.
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

R University

Exam 2015-07-29

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

Type	Exam ID
999	15072900005

1 ☐☐☐☐☐
2 ☐☐☐☐☐
6 ☐☐☐☐☐

In the following please fill in your answers.

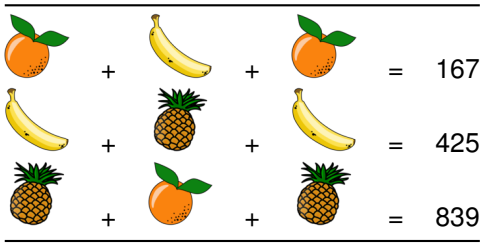
1

2

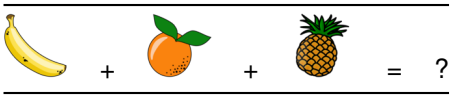
6

1. *(1 point)* What is the derivative of $f(x) = x^2 e^{3.9x}$, evaluated at $x = 0.56$?

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



   Compute:



3. *(1 point)* A machine fills milk into 250ml packages. It is suspected that the machine is not working correctly and that the amount of milk filled differs from the setpoint $\mu_0 = 250$. A sample of 180 packages filled by the machine are collected. The sample mean $\bar{y}$ is equal to 264.7 and the sample variance s^2_{n-1} is equal to 59.92.

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

   (a) 28.205
   (b) 10.565
   (c) 25.478
   (d) 14.845
   (e) 21.108

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:

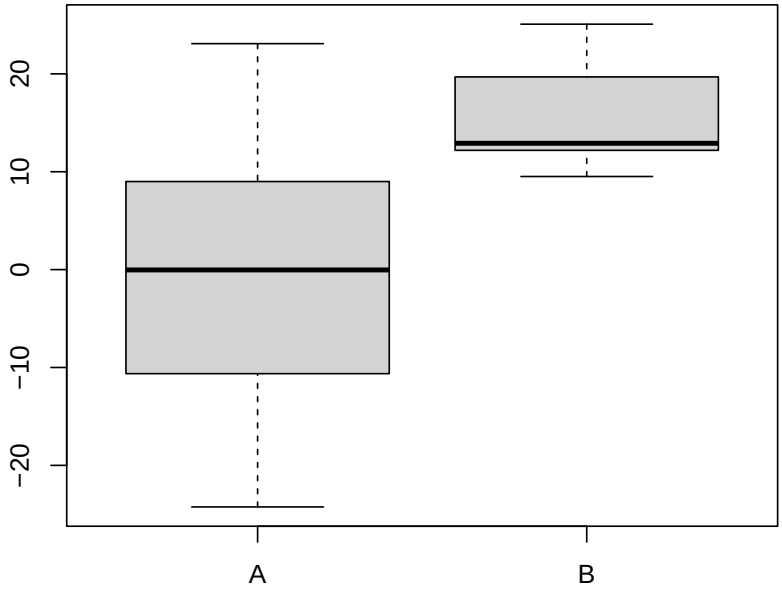
```
        Two Sample t-test

data:  Waiting by Supermarket
t = 0.072076, df = 111, p-value = 0.4713
alternative hypothesis: true difference in means between group Sparag and group Consumo is great
95 percent confidence interval:
 -1.025379       Inf
sample estimates:
 mean in group Sparag mean in group Consumo
             4.939971              4.893391
```

   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)* In the following figure the distributions of a variable given by two samples (A and B) are represented by parallel boxplots. Which of the following statements are correct? *(Comment: The statements are either about correct or clearly wrong.)*



   (a) The location of both distributions is about the same.
   (b) Both distributions contain no outliers.
   (c) The spread in sample A is clearly bigger than in B.
   (d) The skewness of both samples is similar.
   (e) Distribution A is about symmetric.

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