

# Ejercicios derivadas. Fundamentos para el Análisis de Datos y la Investigación

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```
library(mosaicCalc)

## Loading required package: mosaicCore

##
## Attaching package: 'mosaicCalc'

## The following object is masked from 'package:stats':
##
##      D

library(mosaic)

## Loading required package: dplyr

## Warning: package 'dplyr' was built under R version 3.4.2

##
## Attaching package: 'dplyr'

## The following objects are masked from 'package:stats':
##
##      filter, lag

## The following objects are masked from 'package:base':
##
##      intersect, setdiff, setequal, union

## Loading required package: lattice

## Loading required package: ggformula

## Loading required package: ggplot2

##
## New to ggformula? Try the tutorials:
##   learnr::run_tutorial("introduction", package = "ggformula")
##   learnr::run_tutorial("refining", package = "ggformula")

## Loading required package: mosaicData

## Loading required package: Matrix
```

```
##
## The 'mosaic' package masks several functions from core packages in
## order to add
## additional features. The original behavior of these functions should
## not be affected by this.
##
## Note: If you use the Matrix package, be sure to load it BEFORE loading
## mosaic.

##
## Attaching package: 'mosaic'

## The following object is masked from 'package:Matrix':
##
##      mean

## The following objects are masked from 'package:dplyr':
##
##      count, do, tally

## The following objects are masked from 'package:stats':
##
##      binom.test, cor, cor.test, cov, fivenum, IQR, median,
##      prop.test, quantile, sd, t.test, var

## The following objects are masked from 'package:base':
##
##      max, mean, min, prod, range, sample, sum
```

-EJERCICIO 1- Ejercicio 1.a:

```
g=mosaicCalc::D(3*x^2 - 2*x + 4 ~x)
g

## function (x)
## 3 * (2 * x) - 2

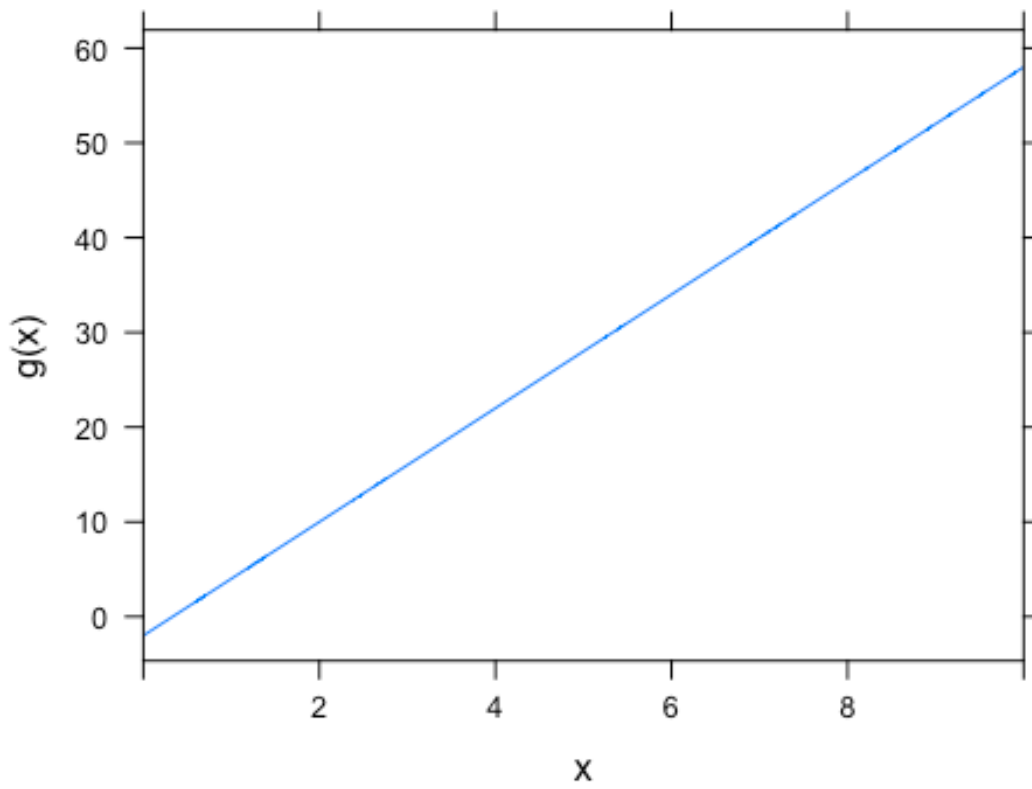
g(0)

## [1] -2
```

Solución 1.a = -2

Ejercicio 1.b:

```
plotFun(g, x.lim=range(0,10))
```



Solución 1.a = B

-EJERCICIO 2-

```
g2=mosaicCalc::D(5*exp(.2*x) ~x)
g2

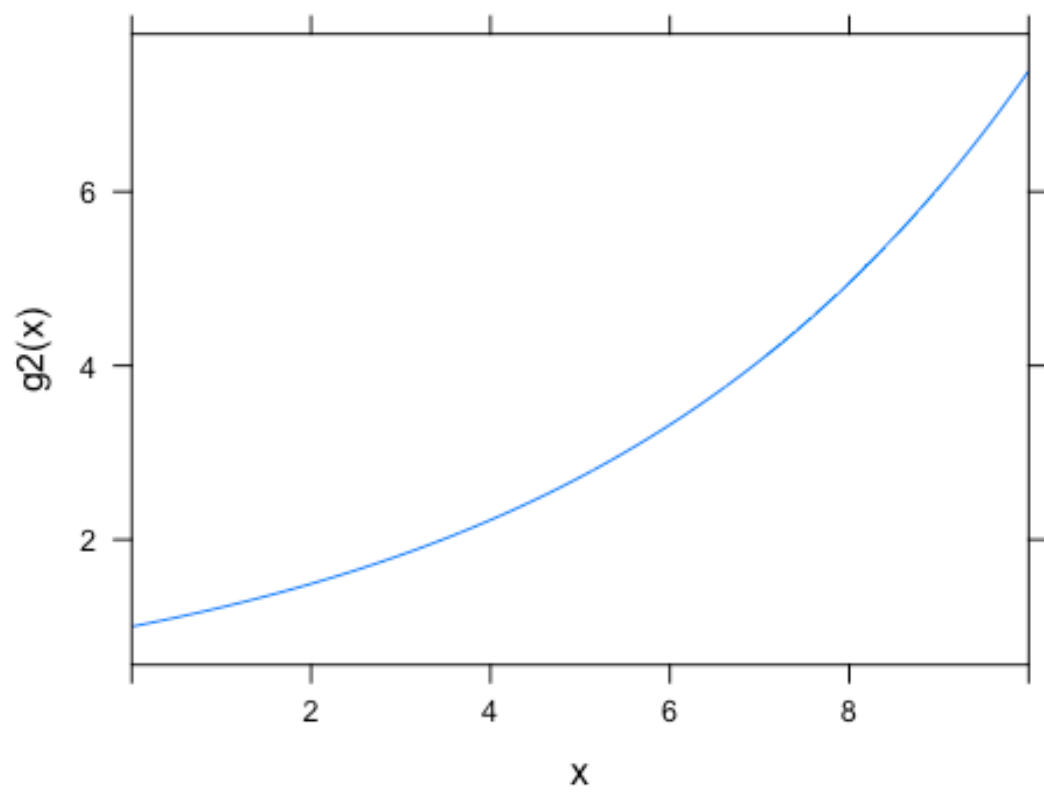
## function (x)
## 5 * (exp(0.2 * x) * 0.2)

g2(0)

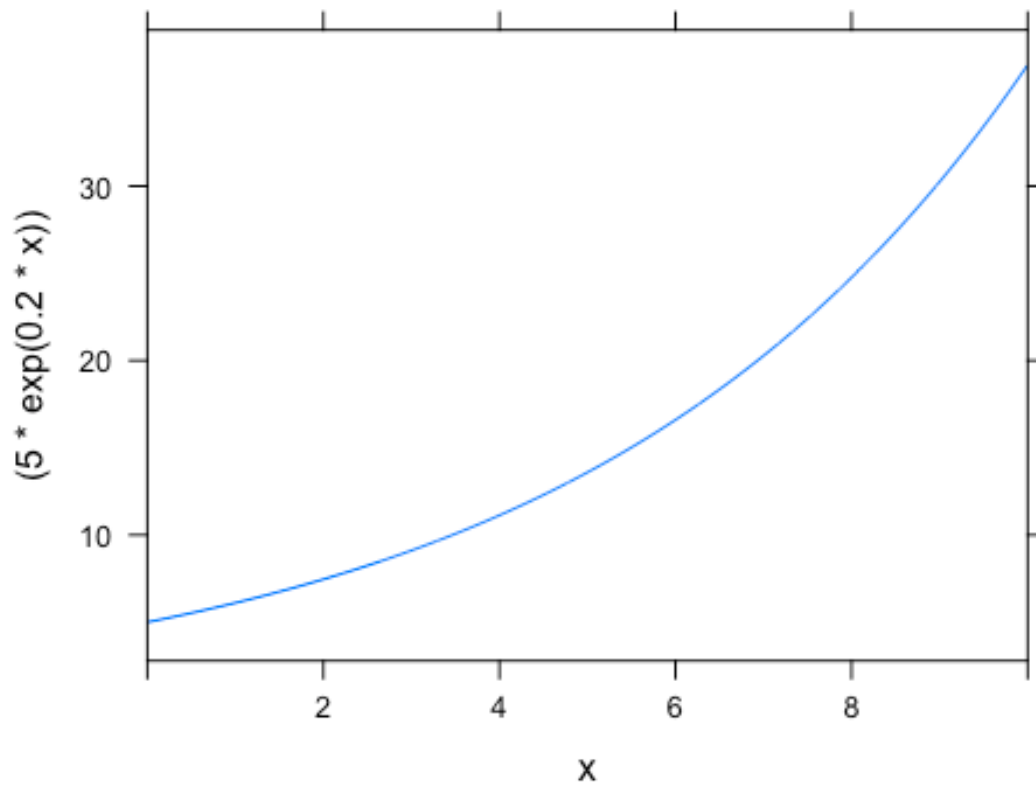
## [1] 1
```

Solución 2.a= 1

```
plotFun(g2, x.lim=range(0,10))
```



```
g3= ((5*exp(.2*x)) ~x)
plotFun(g3 , x.lim=range(0,10) )
```

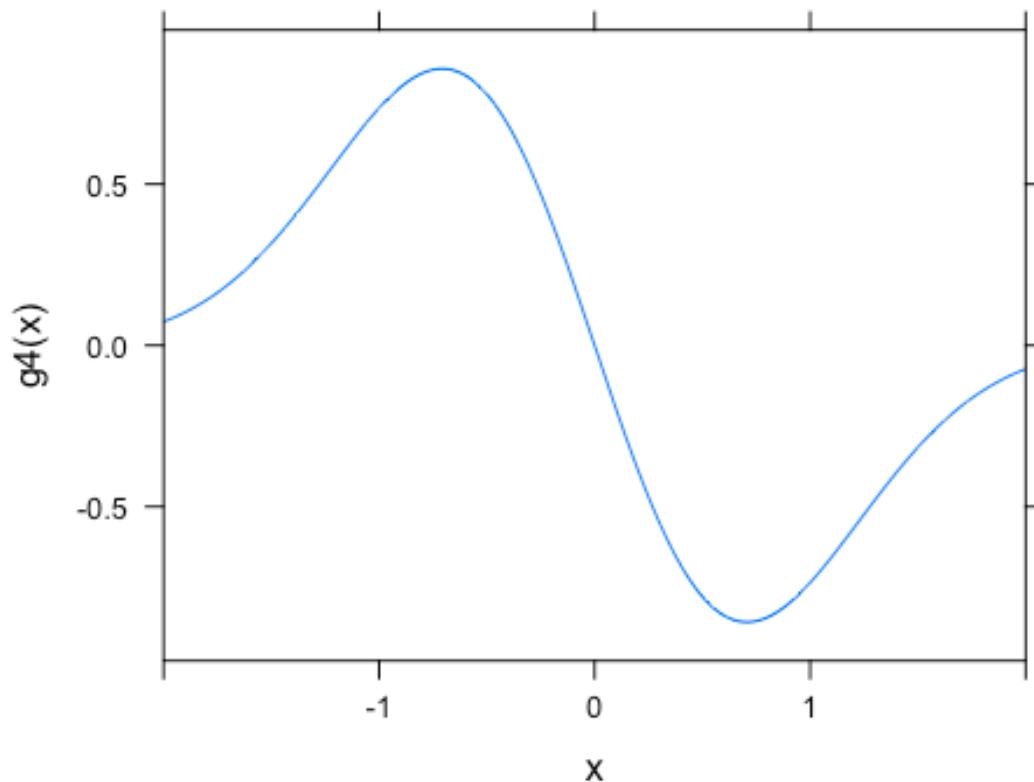


Solución 2.a= B - Misma forma pero distinta velocidad de crecimiento.

-EJERCICIO 3-

```
g4=mosaicCalc::D(exp(-(x^2)) ~x)
```

```
plotFun(g4 , x.lim=range(-2,2) )
```



Solución 3: C - Ola positiva seguida de ola negativa.

-EJERCICIO 4-

```
g5=mosaicCalc::D(fred^2 ~ginger)

## Warning in makeFun.formula(formula, ...): Implicit variables without
## default values (dangerous!): fred

g5

## function (ginger, fred)
## 0
```

Solución 4: A - 0 everywhere.

-EJERCICIO 5-

```
g6=mosaicCalc::D(cos(2*t) ~ t&t&t)
g6

## function (t)
## sin(2 * t) * 2 * 2 * 2
```

Solución 5.a:  $D) = 8\sin(2t)$

```
g7=mosaicCalc::D(cos(2*t) ~ t&t&t&t)
g7
```

```
## function (t)
## cos(2 * t) * 2 * 2 * 2 * 2
```

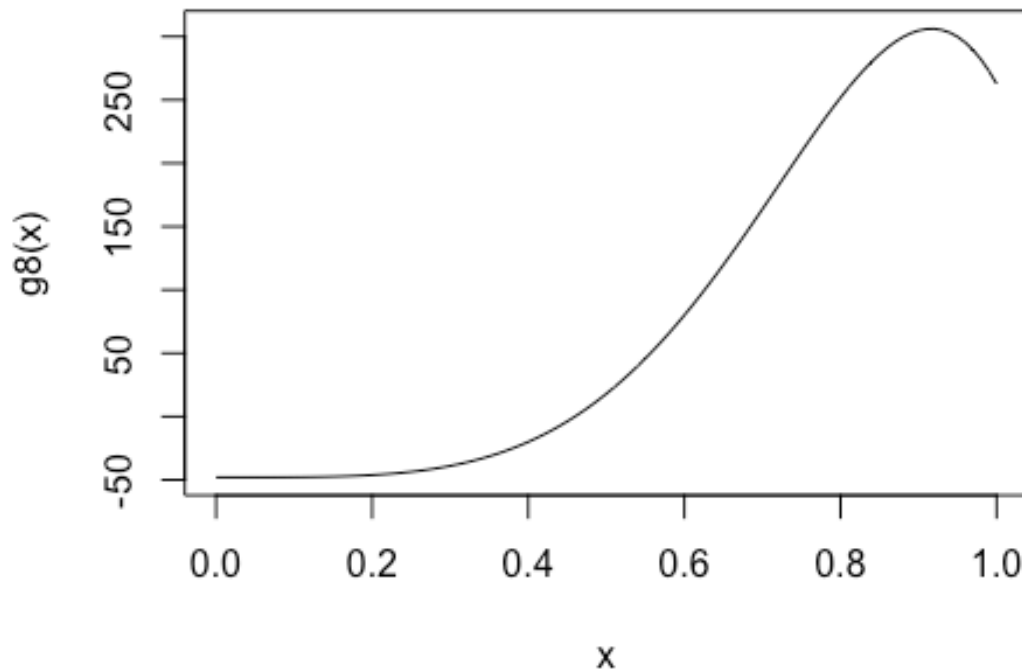
Solución 5.b:  $E = 16\cos(2t)$

-EJERCICIO 6-

```
g8=mosaicCalc::D(cos(2*t^2) ~ t&t&t&t)
g8
```

```
## function (t)
## -((cos(2 * t^2) * (2 * 2) - sin(2 * t^2) * (2 * (2 * t)) * (2 *
##   (2 * t))) * (2 * 2) - (sin(2 * t^2) * (2 * (2 * t)) * (2 *
##   2) + ((cos(2 * t^2) * (2 * (2 * t)) * (2 * (2 * t)) + sin(2 *
##   t^2) * (2 * 2)) * (2 * (2 * t)) + sin(2 * t^2) * (2 * (2 *
##   t)) * (2 * 2))) * (2 * (2 * t)) + (cos(2 * t^2) * (2 * 2) -
##   sin(2 * t^2) * (2 * (2 * t)) * (2 * (2 * t))) * (2 * 2) +
##   (cos(2 * t^2) * (2 * 2) - sin(2 * t^2) * (2 * (2 * t)) *
##   (2 * (2 * t))) * (2 * 2))
```

```
curve(g8,c(0,5))
```



Solución 6.a: C)= Un coseno cuya amplitud crece y cuyo periodo decrece. Solución 6.b: C)= Cos, sin, squaring, multiplication and addition.

-EJERCICIO 7-

```
g91=mosaicCalc::D(x*sin(y)~x)
## Warning in makeFun.formula(formula, ...): Implicit variables without
## default values (dangerous!): y
g92=mosaicCalc::D(x*sin(y)~y)
## Warning in makeFun.formula(formula, ...): Implicit variables without
## default values (dangerous!): x
g911=mosaicCalc::D(x*sin(y)~x+x)
## Warning in makeFun.formula(formula, ...): Implicit variables without
## default values (dangerous!): y
g912=mosaicCalc::D(x*sin(y)~x)
## Warning in makeFun.formula(formula, ...): Implicit variables without
## default values (dangerous!): y
g921=mosaicCalc::D(x*sin(y)~x)
```



```

## Warning in makeFun.formula(formula, ...): Implicit variables without
## default values (dangerous!): y

g922=mosaicCalc::D(x*sin(y)~y+y)

## Warning in makeFun.formula(formula, ...): Implicit variables without
## default values (dangerous!): x

g91

## function (x, y)
## sin(y)

g91(2,3)

## [1] 0.14112

g91(3,2)

## [1] 0.9092974

g92

## function (y, x)
## x * cos(y)

g92(2,3)

## [1] -1.248441

g92(3,2)

## [1] -1.979985

g911

## function (x, y)
## 0

g911(2,3)

## [1] 0

g911(3,2)

## [1] 0

g912

## function (x, y)
## sin(y)

g912(2,3)

## [1] 0.14112

```

```
g912(3,2)
## [1] 0.9092974

g921
## function (x, y)
## sin(y)

g921(2,3)
## [1] 0.14112

g921(3,2)
## [1] 0.9092974

g922
## function (y, x)
## -(x * sin(y))

g922(2,3)
## [1] -2.727892

g922(3,2)
## [1] -0.28224
```

Solución 7.A: FALSO Solución 7.B: FALSO Solución 7.C: VERDADERO