

R Trix for Kids?

Panel Discussion - Canadian Math Education Forum

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Outline

Setting a Context: A Brief Pre-History of R Trix

A Sample of R

The R Trix Site

Setting a Context: A Brief Pre-History of R Trix

**IN THE BEGINNING, THERE WAS CHAOS! AND THEN
THERE WAS C! and chaos**

1970's, 1980's and early 1990's: S and S-plus

Goal: Statistical Methodological Research

**Audience: Researchers at Bell Labs, and at other high
level organizations, statistics researchers and graduate
students**

Setting a Context: A Brief Pre-History of R

1996: An R is Born

2000's, and early 2010's: R

Goal: Methodological and Scientific Research

Audience: Statistics Researchers, Faculty, Graduate Students

More Recently: Undergraduate Students, Scientific Researchers, Major Corporations (e.g. Google, IBM)

Setting a Context: A Brief Pre-History of R Trix

The Future: Secondary School students, ..., Middle School students, ..., Elementary

~> R Trix: R Teaching Resources for Interactive eXploration of data and chance

Setting a Context: A Brief Pre-History of R

R is a statistical program which is available online

Home (CRAN) is in Vienna, but there are now hundreds of mirror sites worldwide

Open Source, so it is freely available

Powerful, using the best known statistical and numerical software, contributed to by 1000's of researchers worldwide

Increasingly in use by industry

A Sample of R

Arithmetic:

```
> 23 + 49
```

```
[1] 72
```

```
> 359 - 198
```

```
[1] 161
```

A Sample of R

```
> 11111*11111
```

```
[1] 123454321
```

```
> 1234567654321/1111111
```

```
[1] 1111111
```


A Sample of R

```
> 1111^2          # taking the square
```

```
[1] 1234321
```

```
> sqrt(12345678987654321)    # square root
```

```
[1] 1111111111
```

A Sample of R

Draw the graph of

$$p(x) = (x - 5)(x - 3)(2x - 7)$$

for $x \in (2, 6)$.

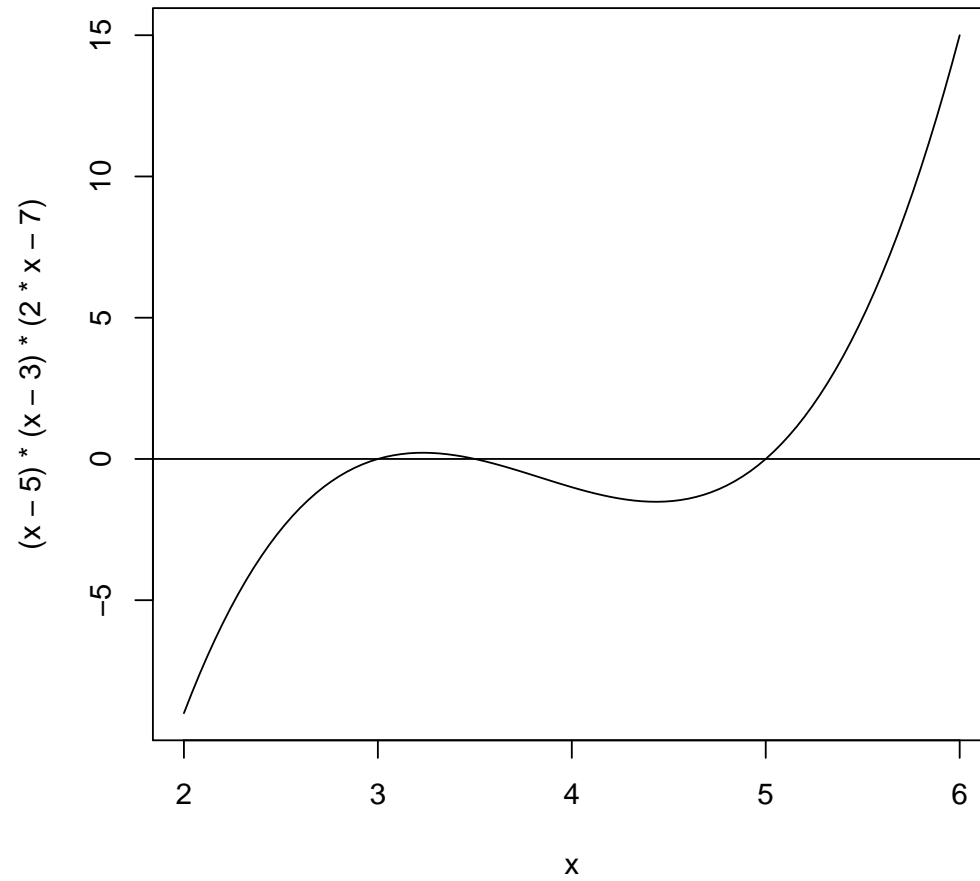
> *# draw the curve*

> *curve((x-5)*(x-3)*(2*x-7), from=2, to=6)*

> *# add a horizontal line through the origin*

> *abline(h=0)*

A Sample of R



A Sample of R

Statistics

```
> weights <- c(35, 45, 44, 36, 38)    # some data  
> mean(weights)                       # average
```

```
[1] 39.6
```

```
> sd(weights)                         # standard deviation
```

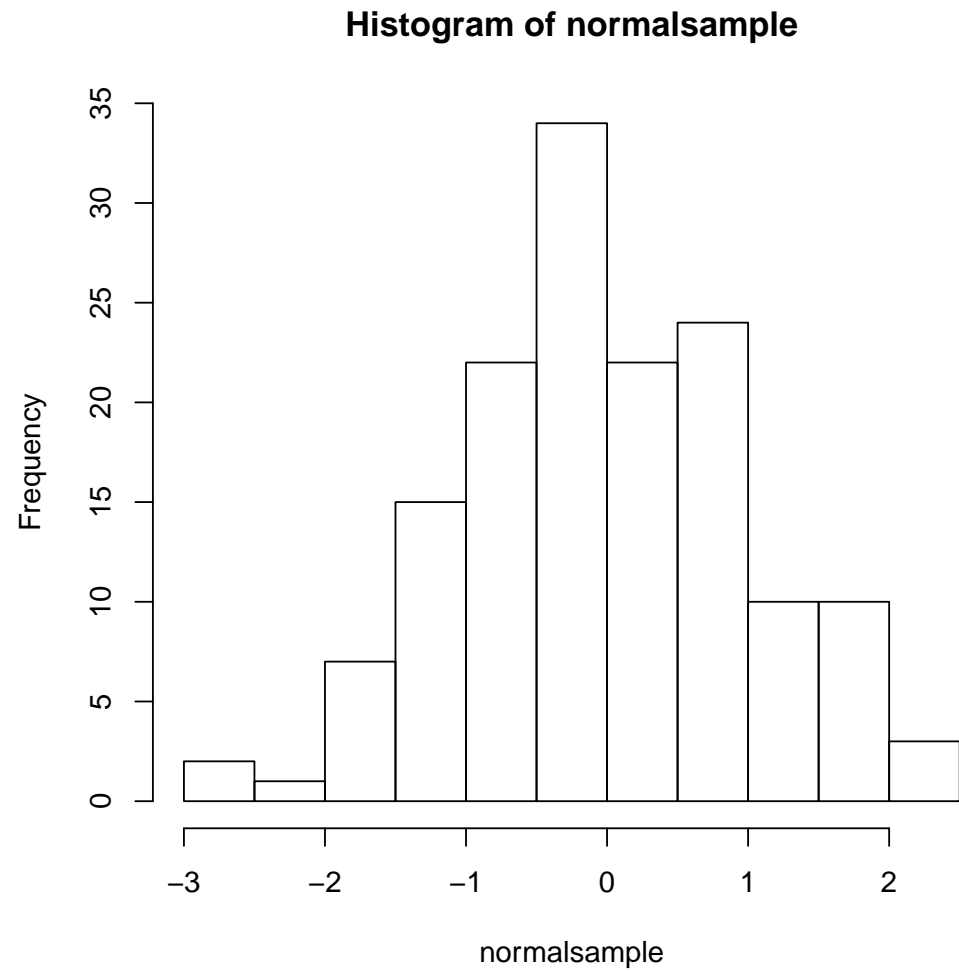
```
[1] 4.615192
```

A Sample of R

Simulating random data

```
> normalsample <- rnorm(150) # 150 random normals  
> hist(normalsample)      # draw a histogram
```

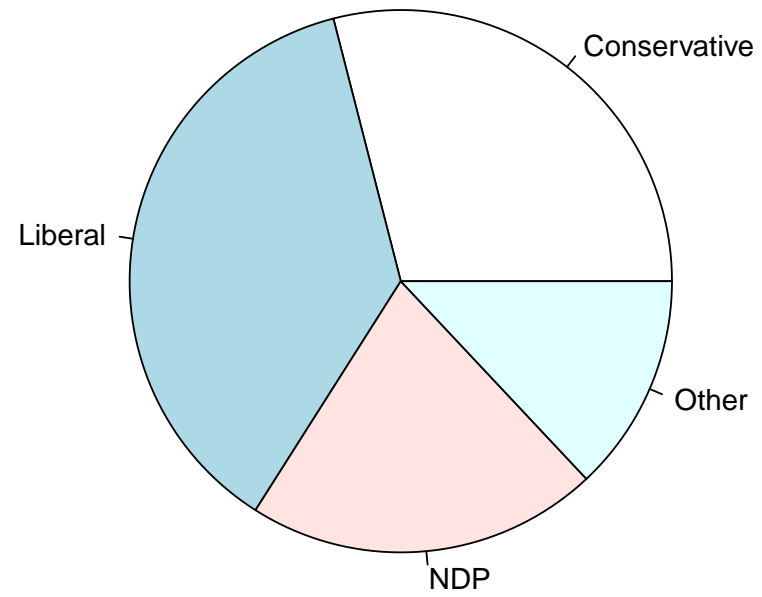
A Sample of R



A Sample of R

```
> pie(c("Conservative"=29, "Liberal"=37,  
+      "NDP"=21, "Other"=13))
```

A Sample of R



Typical Initial Reaction to R

“It’s too hard... the learning curve is steep...it will be confusing ...”

↪ R Trix: R Teaching Resources for Interactive eXploration of data and chance

The R Trix Site

A growing collection of resources and tools which can be used in introductory statistics and data management classes

R Apps for math and statistics which do not require knowledge of R, accessible by many mobile devices

All of the examples provided here can be easily reproduced using an app

Materials can currently be accessed from

`www.stats.uwo.ca/faculty/braun`

The R Trix Site

Selected Apps:

- **Probability Calculator**
- **Coin Tossing, Dice, Poker, and Monopoly Simulators**
- **Bar charts, Pie charts, histograms, pictographs, scattergraphs, etc.**
- **Drawing lines**

Concluding Remarks

R is a powerful tool which can be placed in the hands of secondary school students to aid in mathematics and statistics calculations, simulations, and graphing

R Trix is under development to

- **ease the transition to full-blown R**
- **provide students with online tools to possibly remove the need for special graphics calculators**
- **defer system administration issues related to site-wide installation of R**