

# IS5 in R: More About Tests and Intervals (Chapter 16)

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## Introduction and background

This document is intended to help describe how to undertake analyses introduced as examples in the Fifth Edition of *Intro Stats* (2018) by De Veaux, Velleman, and Bock. More information about the book can be found at [http://wps.aw.com/aw\\_deveaux\\_stats\\_series](http://wps.aw.com/aw_deveaux_stats_series). This file as well as the associated R Markdown reproducible analysis source file used to create it can be found at <http://nhorton.people.amherst.edu/is5>.

This work leverages initiatives undertaken by Project MOSAIC (<http://www.mosaic-web.org>), an NSF-funded effort to improve the teaching of statistics, calculus, science and computing in the undergraduate curriculum. In particular, we utilize the `mosaic` package, which was written to simplify the use of R for introductory statistics courses. A short summary of the R needed to teach introductory statistics can be found in the `mosaic` package vignettes (<http://cran.r-project.org/web/packages/mosaic>). A paper describing the `mosaic` approach was published in the *R Journal*: <https://journal.r-project.org/archive/2017/RJ-2017-024>.

## Chapter 16: More About Tests and Intervals

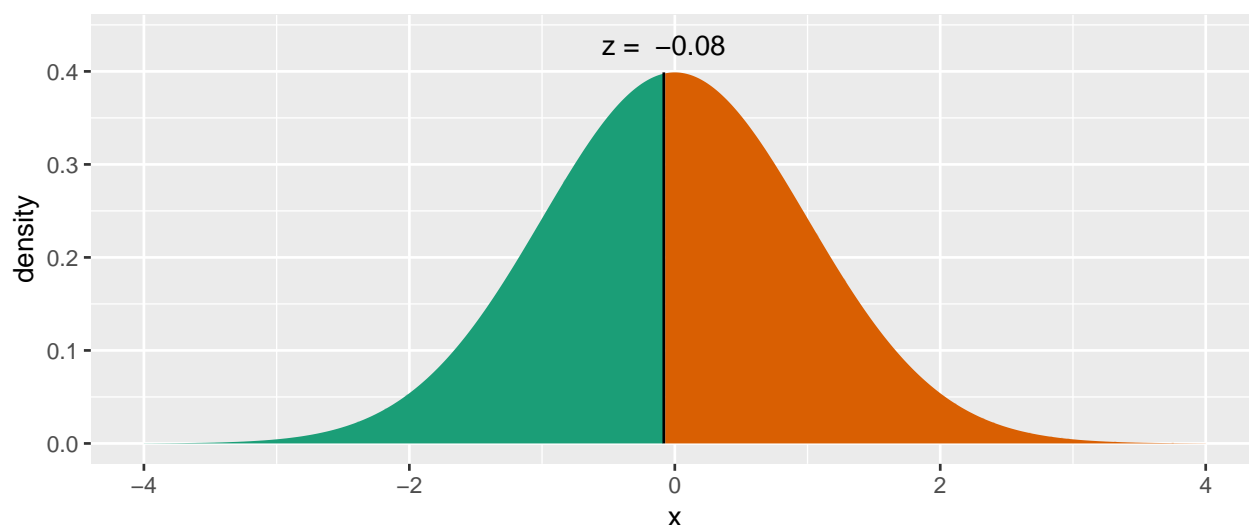
```
library(mosaic)
```

### Section 16.1: Interpreting P-Values

#### What to Do with a Low P-Value

#### What to Do with a High P-Value

```
# curve on page 511  
xqnorm(p = .467, mean = 0, sd = 1, verbose = FALSE)
```

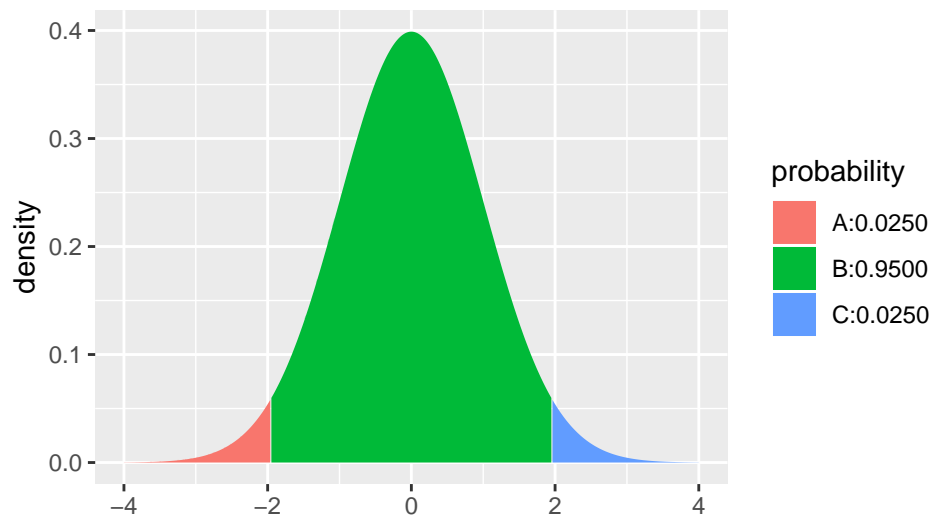


```
## [1] -0.08281329
```

## Section 16.2: Alpha Levels and Critical Values

*# Figure 16.1, page 513*

```
xpnorm(q = c(-1.96, 1.96), mean = 0, sd = 1, verbose = FALSE)
```



```
## [1] 0.0249979 0.9750021
```

## Section 16.3: Practical vs. Statistical Significance

### Section 16.4: Errors

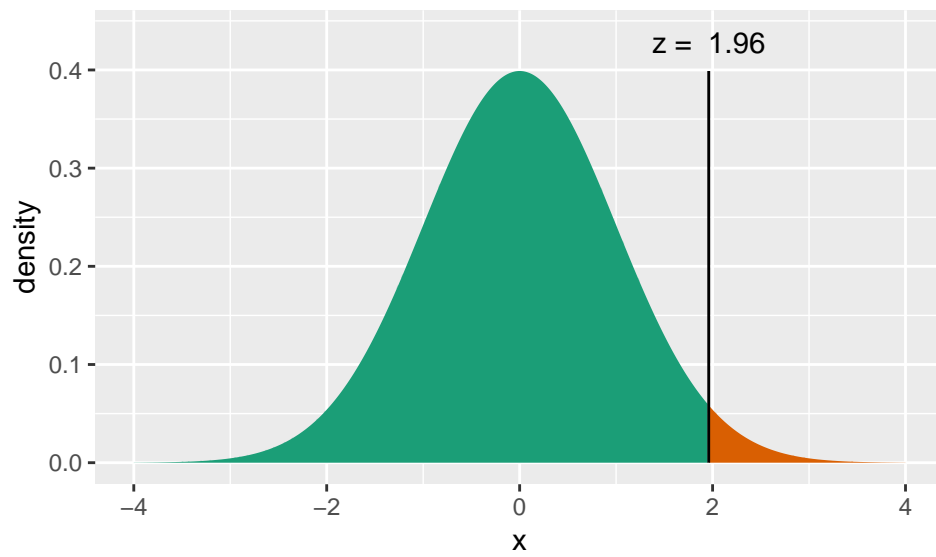
Power

Effect Size

A Picture Worth  $\frac{1}{P(z > 3.09)}$  Words

*# Figure 16.2, page 520*

```
xpnorm(q = 1.96, mean = 0, sd = 1, verbose = FALSE)
```



```
## [1] 0.9750021
```

```
# Not sure how to do this
```

```
#ggplot(data.frame(x = c(-4, 8)), aes(x)) +  
# stat_function(fun = dnorm, args = list(mean = 0, sd = 1), col='red') +  
# stat_function(fun = dnorm, args = list(mean = 4, sd = 1), col='blue') +  
# geom_vline()
```