```r
# 1. If Z is norm (mean = 0, sd = 1)

#  Find P(Z > 2.64)

#  Find P(|Z| > 1.39)


pnorm(2.64, mean = 0, sd = 1, lower.tail = FALSE)

# P(Z > 2.64) is 0.0041


#------------------------


#  Find P(|Z| > 1.39)

#  = 1 - P(-1.39 < X < 1.39)

1 - (pnorm(1.39, mean = 0, sd=1) - pnorm(-1.39, mean = 0, sd=1))

#  P(|Z| > 1.39) is 0.1645


#------------------------


# Suppose p = the proportion of students who are admitted to the graduate school

# of the University of California at Berkeley, and suppose that a public relation

# officer boasts that UCB has historically had a 40% acceptance rate for its graduate

# school. Consider the data stored in the table UCBAdmissions from 1973. Assuming

# these observations constituted a simple random sample, are they consistent with

# the officer's claim, or do they provide evidence that the acceptance rate was

# significantly less than 40%? Use an alpha = 0.01 significance level.


View(UCBAdmissions)

class(UCBAdmissions)
```

```
# Our null hypothesis, H0 is p= 0.40

# Alternative Hypothesis , Ha is p < 0.4


-qnorm(0.99)

# z alpha = -2.326348


A <- as.data.frame(UCBAdmissions)

head(A)


xtabs(Freq ~ Admit, data = A)


# ow we calculate the value of the test statistic.

phat <- 1755/(1755 + 2771)

(phat - 0.4)/sqrt(0.4 * 0.6/(1755 + 2771))

# t statistics is -1.680919

# Our test statistic is not less than ???2.32,


prop.test(1755, 1755 + 2771, p = 0.4, alternative = "less",

        conf.level = 0.99, correct = FALSE)


# p- value i.e. 0.046 is greater than alpha i.e. 0.01


library(IPSUR)

library(HH)

temp <- prop.test(1755, 1755 + 2771, p = 0.4, alternative = "less",

               + conf.level = 0.99, correct = FALSE)
```

plot(temp, "Hypoth")

so it does not fall into the critical region.

Therefore, we fail to reject the null hypothesis that the true proportion of students admitted to graduate school is less than 40% and say that the observed data are consistent with the officer's claim at

```
> pnorm(2.64, mean = 0, sd = 1, lower.tail = FALSE)
[1] 0.004145301
> #  Find P(|Z| > 1.39)
> #  = 1 - P(-1.39 < X < 1.39)
> 1 - (pnorm(1.39, mean = 0, sd=1) - pnorm(-1.39, mean = 0, sd=1))
[1] 0.1645289
> View(UCBAdmissions)
> class(UCBAdmissions)
[1] "table"
> -qnorm(0.99)
[1] -2.326348
> A <- as.data.frame(UCBAdmissions)
> head(A)
     Admit Gender Dept Freq
1 Admitted   Male    A  512
2 Rejected   Male    A  313
3 Admitted Female    A   89
4 Rejected Female    A   19
5 Admitted   Male    B  353
6 Rejected   Male    B  207
> xtabs(Freq ~ Admit, data = A)
Admit
Admitted Rejected
    1755     2771
> # ow we calculate the value of the test statistic.
> phat <- 1755/(1755 + 2771)
> (phat - 0.4)/sqrt(0.4 * 0.6/(1755 + 2771))
[1] -1.680919
```

```
> prop.test(1755, 1755 + 2771, p = 0.4, alternative = "less",
+           conf.level = 0.99, correct = FALSE)

        1-sample proportions test without continuity correction

data:  1755 out of 1755 + 2771, null probability 0.4
X-squared = 2.8255, df = 1, p-value = 0.04639
alternative hypothesis: true p is less than 0.4
99 percent confidence interval:
 0.0000000 0.4047326
sample estimates:
        p
0.3877596
```