社統作業

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一、課本

7.1

a. +1.65 or -1.65
   ±1.65
   ±1.89
   +2.33 or -2.33
   ±2.33

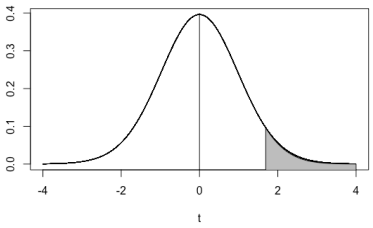
b. ±1.697
   ±2.500
   ±2.617
   +2.457 or -2.457
   +1.671 or -1.671

c.

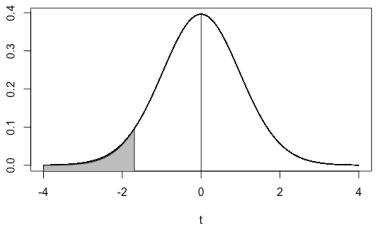
1. Z(obtained) = -2.2/0.053033 = -41.48
2. t(obtained) = -0.3/0.1356801 = -2.21
3. Z(obtained) = -0.8/0.1392694 = -5.74
4. Z(obtained) = 0.03/0.0457689 = 0.66
5. Z(obtained) = -0.02/0.0259942 = -0.77

7.8

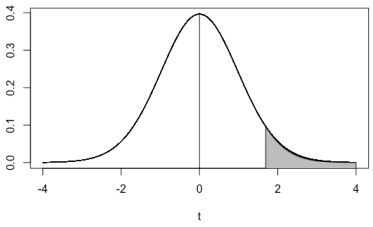
a. H0: mu = 2.47
   H1: mu > 2.47
   alpha = 0.05, one-tailed
   t(critical) = 1.691
   t(obtained) = 0.666
   fail to reject H0



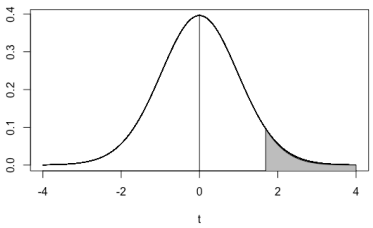
b. H0: mu = 6.137
   H1: mu < 6.137
   alpha = 0.05, one-tailed
   t(critical) = - 1.691
   t(obtained) = -7.128
   reject H0



c. H0: mu = 103
   H1: mu > 103
   alpha = 0.05, one-tailed
   t(critical) = 1.691
   t(obtained) = 8.746
   reject H0



   H0: mu = 110
   H1: mu > 110
   alpha = 0.05, one-tailed
   t(critical) = 1.691
   t(obtained) = 8.746
   reject H0



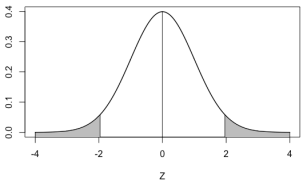
(圖)

```
> t <- seq(-4,4,by=0.0001)
> df34 <- dt(t,df=34)
> plot(t,df34,type = "l",col="black",ylab = " ")
> b1 = seq(4,1.691,len=50)
> polygon(c(b1,rev(b1)),c(dnorm(b1),rep(-0.1,50)),col = 'grey')
```

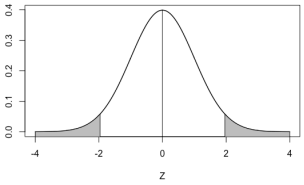
```
> a0 <- c(0,0)
> b0 <- c(dnorm(0),-0.1)
> lines(a0,b0)
> plot(t,df34,type = "l",col="black",ylab = " ")
> b2 = seq(-4,-1.691,len=50)
> polygon(c(b2,rev(b2)),c(dnorm(b2),rep(-0.1,50)),col = 'grey')
> lines(a0,b0)
```

7.15
alpha = 0.05, two-tailed
Z(critical) = ± 1.96

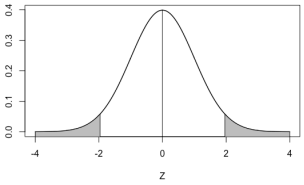
a. H0: Pu = 0.65
   H1: Pu ≠ 0.65
   Z(obtained) = -0.04/0.026788 = -1.49
   fail to reject H0



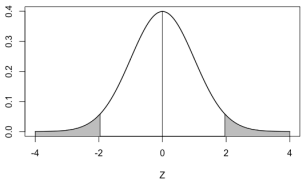
b. H0: Pu = 0.21
   H1: Pu ≠ 0.21
   Z(obtained) = 0.05/0.0228757 = 2.19
   reject H0



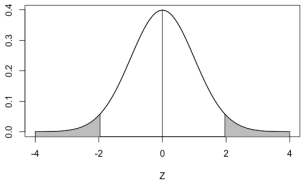
c. H0: Pu = 0.51
   H1: Pu ≠ 0.51
   Z(obtained) = -0.24/0.0280766 = -8.55
   reject H0



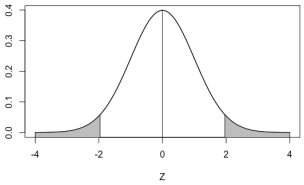
d. H0: Pu = 0.82
   H1: Pu ≠ 0.82
   Z(obtained) = -0.39/0.0215777 = -18.07
   reject H0



e. H0: mu = 12.3
   H1: mu ≠ 12.3
   Z(obtained) = 0.2/0.0956324 = 2.09
   reject H0



f. H0: mu = 5.2
   H1: mu ≠ 5.2
   Z(obtained) = -1.5/0.0281271 = -53.33
   reject H0



Only mother's educational level is no difference.

(圖)

```
> Z<-seq(from=-4.00,to=4.00,by=0.01)
> y<-dnorm(Z,mean=0,sd=1)
> P<-plot(x=Z,y=y,type = "l",col="black",lwd=1.5,ylab = " ")
> a1 = seq(-4,-1.96,len=50)
> polygon(c(a1,rev(a1)),c(dnorm(a1),rep(-0.1,50)),col = 'grey')
> a2 = seq(4,1.96,len=50)
> polygon(c(a2,rev(a2)),c(dnorm(a2),rep(-0.1,50)),col = 'grey')
> a0 <- c(0,0)
> b0 <- c(dnorm(0),-0.1)
> lines(a0,b0)
```

7.18

a. Because researchers do not have time to test everyone in a large group, and random samples are representative samples of the population.
b. When sample size is large (N>100).
c. Determine what kind of distribution we should use for a test.
d. Null hypothesis states that the sample comes from a population with a certain characteristic, so it should be no difference to the reality.
e. Critical region is the area under the sampling distribution that includes unlikely sample outcomes. The size of critical region is determined by the alpha level.
f. If a program is designed to reduce employment, researchers would only want to know the outcomes that show a decrease in the unemployment rate. So the researchers would use a one-tailed test which stated that unemployment rates of the program would be less than (<) rates in the community.
g. t distribution is flatter than Z distribution. When the alpha levels are the same and both of them are one-tailed or two-tailed tests, t(critical) is larger than Z(critical). Therefore, it is more likely that t(obtained) is not in the critical region, which means that it is more difficult to reject the null hypothesis.
h. Null Hypothesis is rejected.