Test2Review

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Question 1

Part a

```
sigmasq <- 215/(20-3)
XTXinv <- cbind(c(2.5,-2,2),c(-2,0.8,3),c(2,3,0.5))
betahat <- c(2.8,10.5,-5.4)
tstar <- 1.98
betahat1 <- betahat[1]
betahat2 <- betahat[2]
betahat3 <- betahat[3]
SEbetahat1 <- sqrt(sigmasq*XTXinv[1,1])
SEbetahat2 <- sqrt(sigmasq*XTXinv[2,2])
SEbetahat3 <- sqrt(sigmasq*XTXinv[3,3])
SEbetahat1
```

```
## [1] 5.622957
```

```
SEbetahat2
```

```
## [1] 3.180825
```

```
SEbetahat3
```

```
## [1] 2.514663
```

```
CI1 <- c(-1,1)*tstar*SEbetahat1 + betahat1
CI2 <- c(-1,1)*tstar*SEbetahat2 + betahat2
CI3 <- c(-1,1)*tstar*SEbetahat3 + betahat3
CI1
```

```
## [1] -8.333455 13.933455
```

```
CI2
```

```
## [1]  4.201967 16.798033
```

```
CI3
```

```
## [1] -10.3790325  -0.4209675
```

Part b

```
df <- 20-3
# Find the t-scores
t1 <- betahat1/SEbetahat1
t2 <- betahat2/SEbetahat2
```

```r
t3 <- betahat3/SEbetahat3
pval1 <- 2*pt(t1,df)
pval2 <- 2*pt(t2,df)
pval3 <- 2*pt(t3,df)
#pval1
#pval2
#pval3
pval1 <- 2*(1-pt(t1,df))
pval2 <- 2*(1-pt(t2,df))
pval1
```

```
## [1] 0.6248934
```

```r
pval2
```

```
## [1] 0.004220697
```

```r
pval3
```

```
## [1] 0.046475
```