Q4

Exercise 60 on page 673.

a)

$S_{xy} = \frac{\sum x_i \sum y_i}{n} = 1.872$

$\bar{y} = 0.5557143$

$\bar{x} = 0.2407143$

$r = \frac{\sum \left((x_i - \bar{x})(y_i - \bar{(y)}) \right)}{\sqrt{\sum (x_i - \bar{x})^2 \sum (y_i - \bar{y})^2}} = 0.4406567$

$t = \frac{r\sqrt{n-2}}{\sqrt{(1-r^2)}} = 1.700$

$t_{0.1/2,n-2} = 1.7822$

```
x <- c(0.18, 0.20, 0.21, 0.21, 0.21,
    0.22, 0.23,
      0.23, 0.24, 0.24, 0.25, 0.28,
          0.30, 0.37)
y <- c(0.46, 0.70, 0.41, 0.45, 0.55,
    0.44, 0.24,
      0.47, 0.22, 0.80, 0.88, 0.70,
          0.72, 0.74)
n <- length(x)

S_xy <- sum(x)*sum(y)/n

x_bar <- mean(x)
y_bar <- mean(y)

r <-  sum((x - x_bar)*(y - y_bar)) /
      (sqrt(sum((x - x_bar)^2)) *
          sqrt(sum((y - y_bar)^2)))

t <- r * sqrt(n - 2) / sqrt(1 - r^2)

alpha <- 0.10

t_val <- qt(alpha/2, n-2,lower.tail=
    FALSE)
reject = t >= t_val || t <= -1 * t_
    val
```

Rejection region:
either $t \geqslant t_{\alpha/2,n-1}$ or $t \leqslant -t_{\alpha/2,n-1}$

the t value is not in the rejection region

Do not reject the null hypothesis. The data does not show that the correlation coefficient differs from 0 at the given significance level.