MATH 324 Homework 10

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Problem A Through D

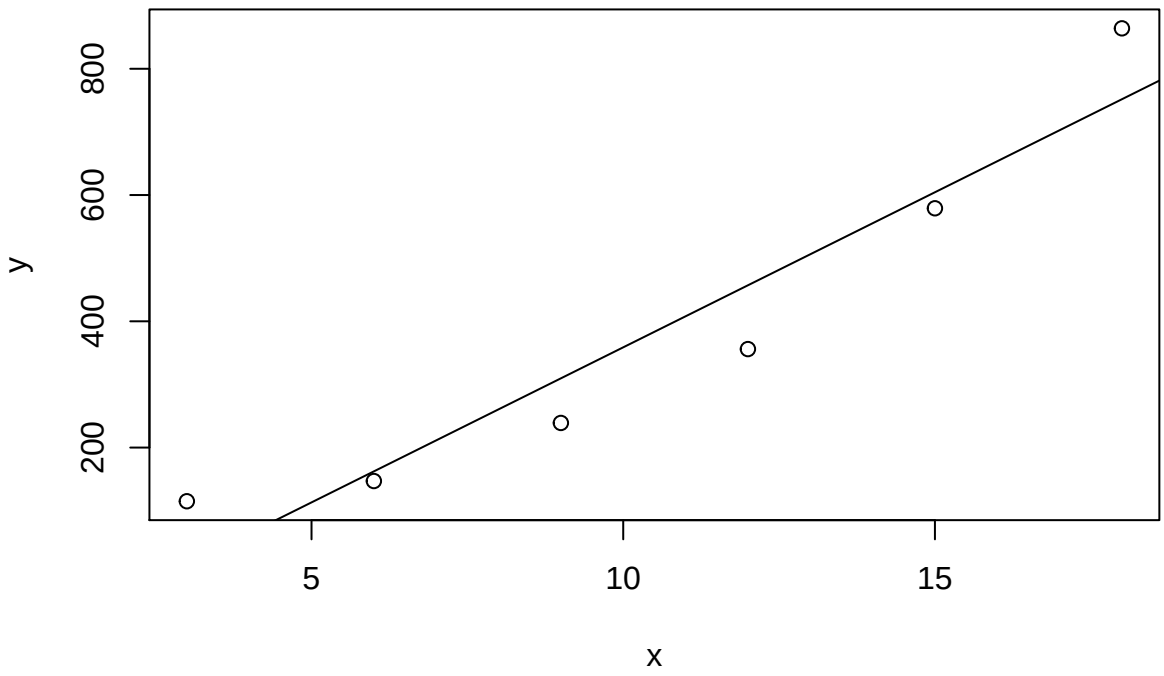
```
x = c(3, 6, 9, 12, 15, 18)
y = c(115, 147, 239, 356, 579, 864)

summary(lm(y~x))
```

```
##
## Call:
## lm(formula = y ~ x)
##
## Residuals:
##       1       2       3       4       5       6
##  100.10  -15.28  -70.65 -101.02  -25.39  112.24
##
## Coefficients:
##             Estimate Std. Error t value Pr(>|t|)
## (Intercept) -132.467     91.558  -1.447  0.22150
## x             49.124      7.837   6.268  0.00331 **
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 98.35 on 4 degrees of freedom
## Multiple R-squared:  0.9076, Adjusted R-squared:  0.8845
## F-statistic: 39.29 on 1 and 4 DF,  p-value: 0.003305
```

Problem D

```
{plot(x, y)
abline(lm(y~x))}
```



Problem E

```
f = function(x){-132.467 + 49.124*x}

f(10)
```

```
## [1] 358.773
```

```
c(f(10) - qnorm(1.95/2)*7.837, f(10) + qnorm(1.95/2)*7.837)
```

```
## [1] 343.4128 374.1332
```

Problem F

```
f(16)
```

```
## [1] 653.517
```

```
c(f(16) - qnorm(1.95/2)*7.837, f(16) + qnorm(1.95/2)*7.837)
```

```
## [1] 638.1568 668.8772
```

Problems G & H

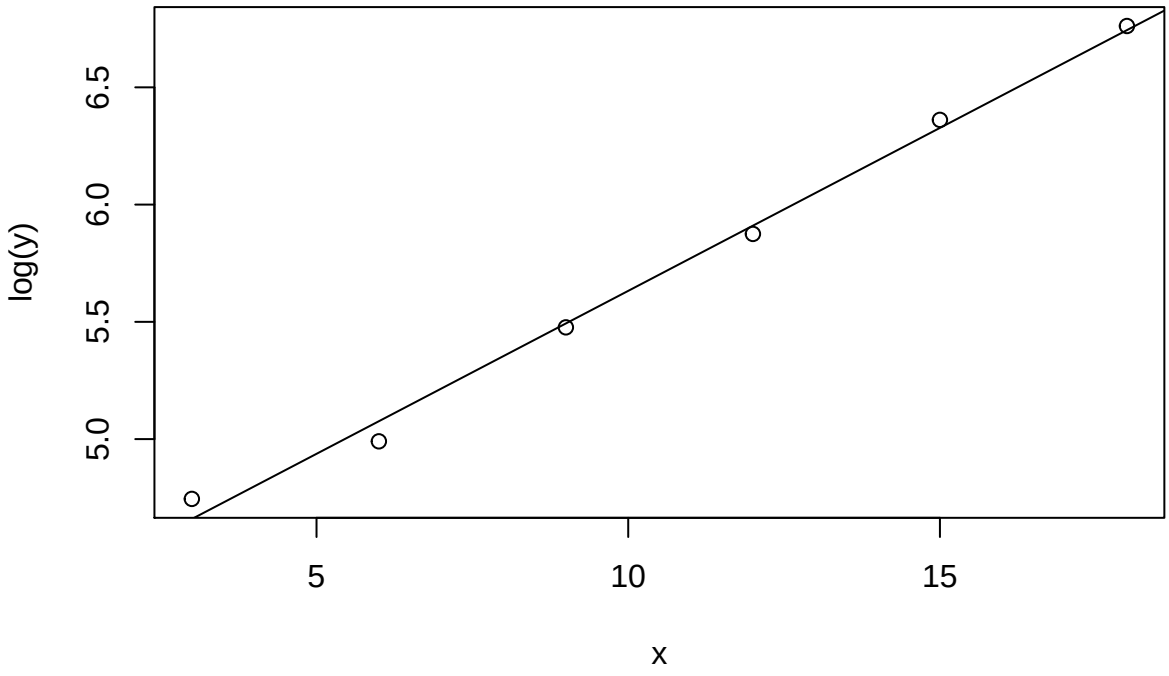
```
summary(lm(log(y)~x))
```

```
##
## Call:
## lm(formula = log(y) ~ x)
##
## Residuals:
```

```
##        1        2        3        4        5        6
##  0.08577 -0.08570 -0.01665 -0.03516  0.03423  0.01752
##
## Coefficients:
##             Estimate Std. Error t value Pr(>|t|)
## (Intercept)  4.24218    0.06192   68.51 2.72e-07 ***
## x            0.13899    0.00530   26.23 1.26e-05 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.06651 on 4 degrees of freedom
## Multiple R-squared:  0.9942, Adjusted R-squared:  0.9928
## F-statistic: 687.8 on 1 and 4 DF,  p-value: 1.256e-05
```

Problem I

```
{plot(x, log(y))
  abline(lm(log(y)~x))}
```



Problem J

```
f2 = function(x){exp(4.24218 + 0.139899*x)}

f2(10)
```

```
## [1] 281.7922
```

```
c(f2(10) - qnorm(1.95/2)*0.00530, f2(10) + qnorm(1.95/2)*0.00530)
```

```
## [1] 281.7818 281.8026
```

Problem K

```
f2(16)
```

```
## [1] 652.3388
```

```
c(f2(16) - qnorm(1.95/2)*0.00530, f2(16) + qnorm(1.95/2)*0.00530)
```

```
## [1] 652.3284 652.3491
```