5.23

a.

I expect that β_2 is negative, because purchase much grams of cocaine by one time, we can expect that there is some discount. β_3 is positive, because the more quality the higher of the price. β_4 is positive, I expect that the inflation rate will get higher as time goes by.

b.

```
Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept) 90.84669    8.58025  10.588 1.39e-14 ***
quant       -0.05997    0.01018  -5.892 2.85e-07 ***
qual         0.11621    0.20326   0.572   0.5700
trend       -2.35458    1.38612  -1.699   0.0954 .
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 20.06 on 52 degrees of freedom
Multiple R-squared:  0.5097,    Adjusted R-squared:  0.4814
F-statistic: 18.02 on 3 and 52 DF,  p-value: 3.806e-08
```

We can see the summary as above. The estimate of β_2 is -0.05997, β_3 is 0.11621, β_4 is -2.35458, they mean when quant goes up by 1 unit, the price will goes down 0.05997 unit, qual goes up by 1unit, the price will goes up 0.11621, trend go up 1 year, the price will go down 2.35458 unit.

c.

the r square is 0.5097, it means that these three variables jointly explain price by 50.97%..

d.

H0:beta2>=0 against H1:beta2<0

The p value is smaller than 0.05, so we reject h0, it means we have the prove that beta2 is smaller than 0, conclude that larger sale quantities are associated with lower prices, consistent with the hypothesis that sellers offer discounts to reduce transaction risks.

e.

H0:beta3<=0 against H1:beta3>0

The p value is larger than 0.05, so we do not reject h0, there is no prove to conclude that the premium is paid by great quality.

f.

the average annual change is -2.35458, as time goes by, the price of cocaine goes down, the possible reason is that the quality of cocaine decrease or the demand of cocaine is decrease, consumer switch to cheaper drug.