The dataset presented here contains measurements of weight (g), tar(mg), nicotine content (mg), carbon monoxide content (mg), brand, and flavor for 25 cigarettes.

Write out the true model and the estimated model for each of the following.

Model 1

```
##
## Call:
## lm(formula = weight ~ tar + nicotine + COcontent, data = cig.dat)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -0.10234 -0.05625 -0.00326  0.04390  0.16439
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)  0.864079   0.061532   14.04  3.8e-12
## tar          0.001161   0.018006    0.06     0.95
## nicotine     0.110888   0.220102    0.50     0.62
## COcontent   -0.000412   0.012255   -0.03     0.97
##
## Residual standard error: 0.0812 on 21 degrees of freedom
## Multiple R-squared:  0.25,Adjusted R-squared:  0.143
## F-statistic: 2.34 on 3 and 21 DF,  p-value: 0.103
```

TRUE model:

Estimated model:

What hypotheses are being tested in the NICOTINE line of the R output above?

Provide the conclusion, in context, of the test of the hypotheses in the previous question.

Model 3

```
##
## Call:
## lm(formula = weight ~ nicotine * Flavor, data = cig.dat)
##
## Residuals:
##     Min      1Q  Median      3Q     Max
## -0.1173 -0.0358 -0.0127  0.0231  0.1554
##
## Coefficients:
##                           Estimate Std. Error t value Pr(>|t|)
## (Intercept)                0.80892    0.06881   11.76  5.7e-09
## nicotine                   0.14714    0.07822    1.88     0.08
## Flavorchocolate            0.20173    0.18370    1.10     0.29
## Flavorclove                0.16767    0.19428    0.86     0.40
## Flavormenthol              0.06397    0.09712    0.66     0.52
## Flavorregular              0.44373    0.27800    1.60     0.13
## nicotine:Flavorchocolate -0.15398    0.21593   -0.71     0.49
## nicotine:Flavorclove     -0.15735    0.23658   -0.67     0.52
## nicotine:Flavormenthol     0.00303    0.09839    0.03     0.98
## nicotine:Flavorregular   -0.47486    0.28428   -1.67     0.12
##
## Residual standard error: 0.0744 on 15 degrees of freedom
## Multiple R-squared:  0.551,Adjusted R-squared:  0.281
## F-statistic: 2.04 on 9 and 15 DF,  p-value: 0.107
## Analysis of Variance Table
##
## Response: weight
##                 Df Sum Sq Mean Sq F value Pr(>F)
## nicotine         1 0.0462  0.0462    8.35  0.011
## Flavor           4 0.0345  0.0086    1.56  0.236
## nicotine:Flavor  4 0.0210  0.0052    0.95  0.463
## Residuals       15 0.0830  0.0055
```

TRUE model:

ESTIMATED model:

What is the estimated regression line for menthol flavored cigarettes?

What hypotheses are being tested in the nicotine:Flavor row above?

Write a conclusion for these hypotheses.

The response is the length of odontoblasts (teeth) in each of 10 guinea pigs at each of three dose levels of Vitamin C (0.5, 1, 2, or 2.5 mg) with each of two delivery methods (orange juice or pill). A total of 60 guinea pigs were studied.

Here is a partial ANOVA table for this example. Fill in the blanks.

```
Analysis of Variance Table

Response: len
           Df  Sum Sq Mean Sq F value    Pr(>F)
supp       __  205.35  205.35  15.572 0.0002312 ***
dose       __ 2426.43  ______    ____ < 2.2e-16 ***
supp:dose  __  108.32   ____    _____ 0.0218603 *
Residuals  __  712.11   13.19
---
Signif. codes:  0 *** 0.001 ** 0.01 * 0.05 . 0.1   1
```

Write out the hypotheses being tested in the `supp:dose` row above.

Write out a conclusion for these hypotheses.