Answers to questions-Laboratory session 5

a) Odds Ratio = exp(β)
Upper Limit of the 95% CI= exp(β+1.96*SE(β)
Lower Limit of the 95% CI= exp(β-1.96*SE(β)

```
. di exp(.60512557)
1.8314822

. di exp(.60512557+1.96*.0678099 )
2.0918168

. di exp(.60512557-1.96*.0678099 )
1.6035472
```

These results are identical to those obtained by the "`blogit, or`" command output. The meaning of these results is that one unit increase in dose results in 83% (60% to 109%) increased Odds of dying.
To estimate the Odds Ratio for 3 units increase in dose we must multiply the estimate β and its SE by 3 and the exponentiate the results:

```
. di exp(3*.60512557)
6.14339

. di exp(3*.60512557+1.96*3*.0678099 )
9.1531577

. di exp(3*.60512557-1.96*3*.0678099 )
4.1233028
```

Compare with the output below

```
. gen dose3=dose/3
. blogit  deaths noexp dose3,or

Logit estimates                                   Number of obs   =        292
                                                  LR chi2(1)      =     153.49
                                                  Prob > chi2     =     0.0000
Log likelihood = -124.31132                       Pseudo R2       =     0.3817

------------------------------------------------------------------------------
_outcome | Odds Ratio   Std. Err.       z     P>|z|       [95% Conf. Interval]
---------+--------------------------------------------------------------------
   dose3 |    6.14339   1.249747      8.924   0.000       4.123334    9.153088
------------------------------------------------------------------------------
```

b) The inclusion of dose2 in the model results in a significant increase in the Log likelihood, thus the "quadratic" model describes the data more accurately than the "linear" one.
We perform now the likelihood ratio test manually (notice the one degree of freedom) …

```
. di chi2tail(1,2*(-119.71879+124.31132))
.00243999
```

… and we obtain the same result as with the lrtest command.