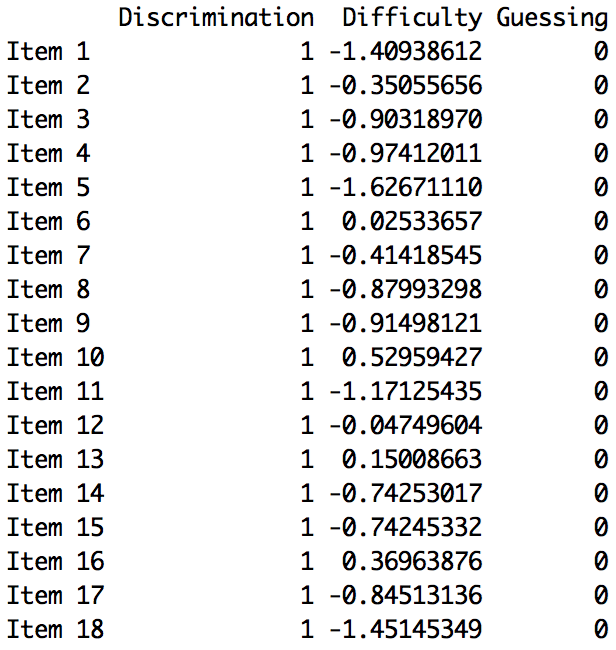
**R Computer Lab #2**

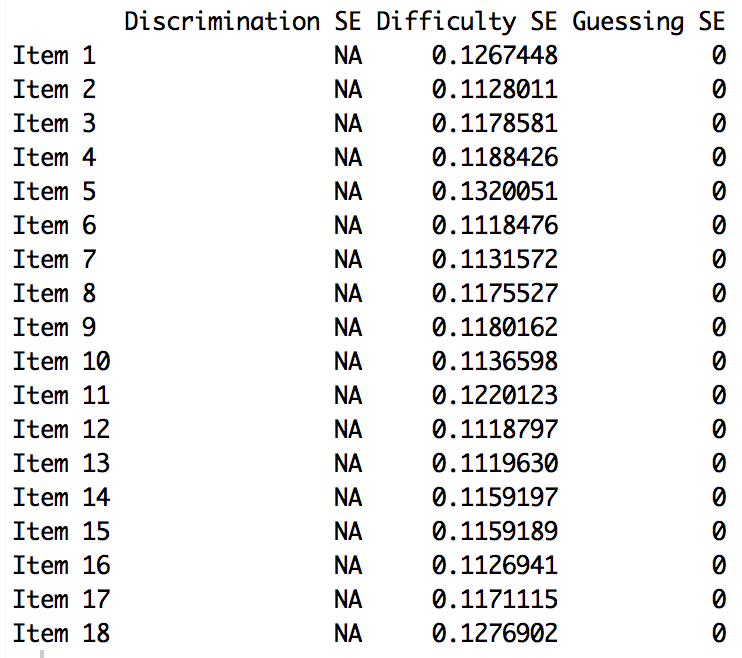
**Student**: Guðrún Alma Einarsdóttir

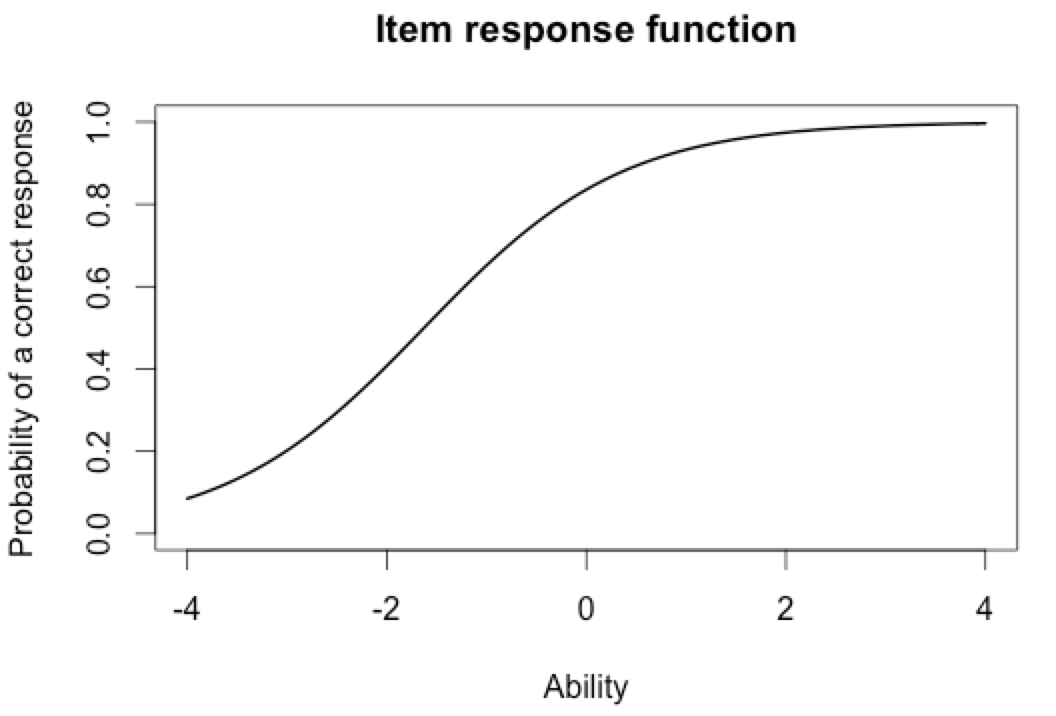
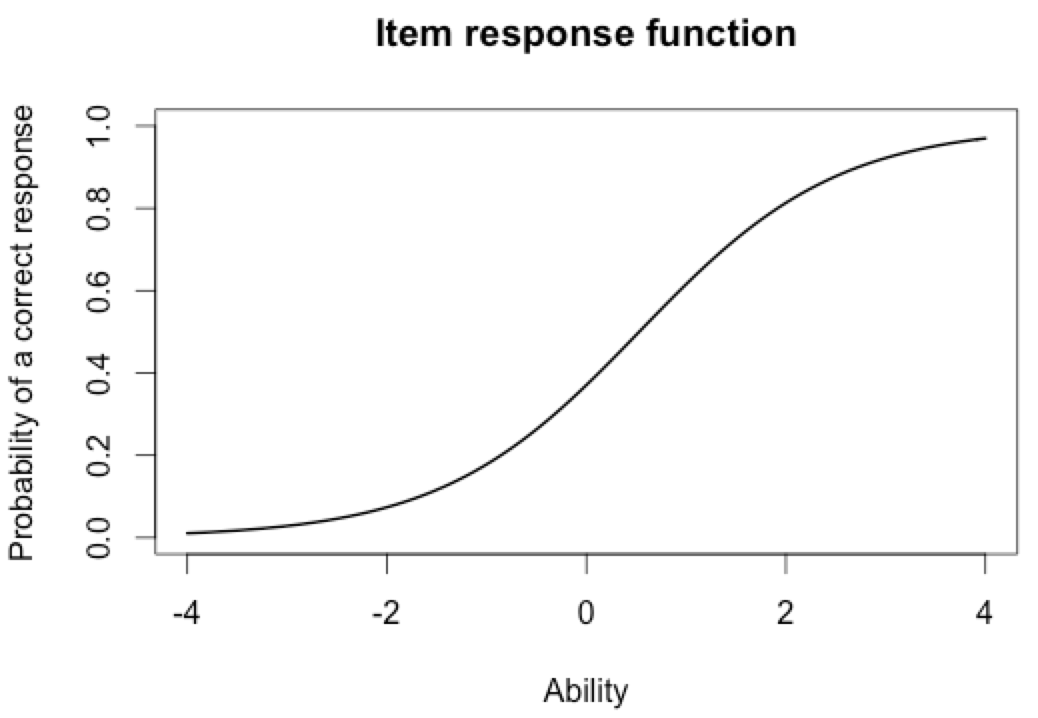
**Partner**: Erna Guðrún Björnsdóttir

**1. a)** Item number 5 was the easiest to answer -1.626 and item 10 was the hardest to answer 0.529.

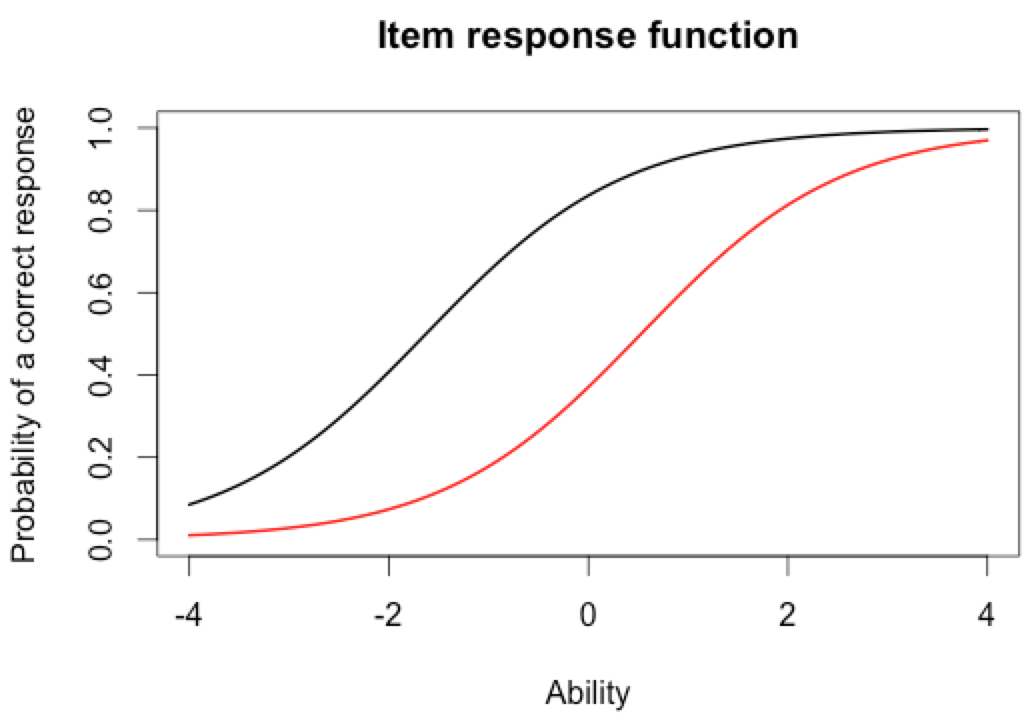
**b)** The spot where the probability of correctly answering item 5 is between -1.88 and -1.37 with 95% confidence.  
  
-1.626 - 1.96 x 0,13 = -1.88

-1.626 + 1.96 x 0,13 = -1.37



**c)**  Item 5 Item 10

Black line: Item 5

Red line: Item 10  
**d)** For the easiest item it will be around 0.8 and for the hardest item around 0.3.

**e)** The score of the person who did best on the test was 3.99. The score of the person who did the worst on the test was -3.99.

> which.max(est\_abl$est) # Prints out the person with the maximum score

[1] 49  
 est sem n

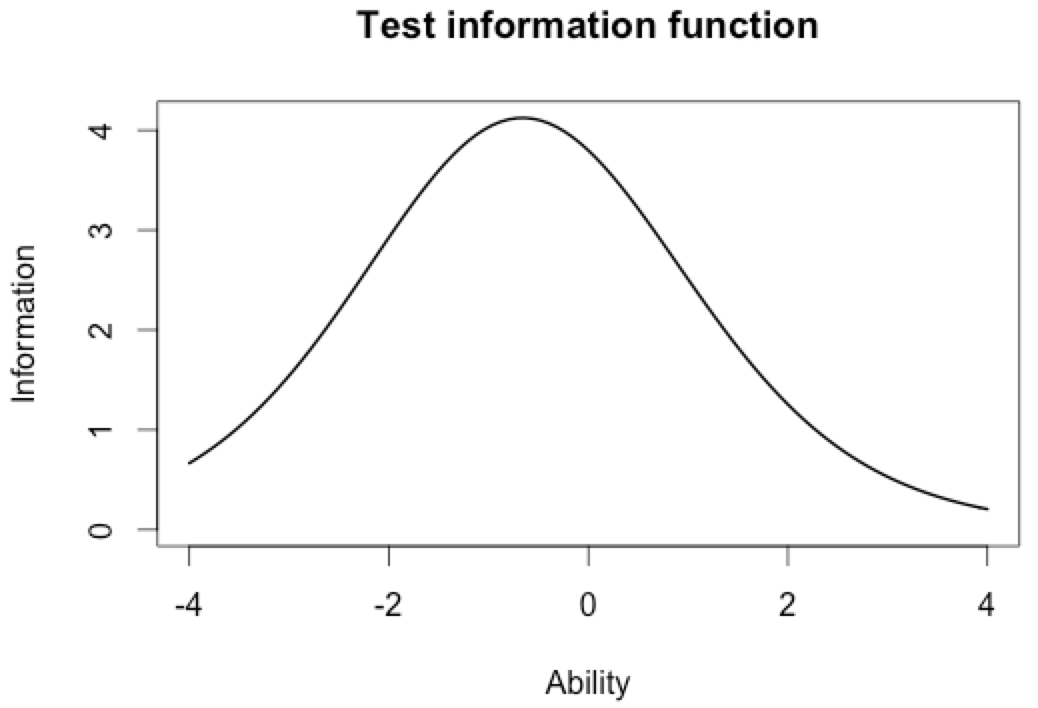
49 3.999921 2.204373 18

> which.min(est\_abl$est) # Prints out the person minimum score

[1] 393

est sem n

393 -3.999947 1.225286 18



**f)** The person that did best on the test, his ability estimate was between -0,322 and 8,30 with 95% confidence.

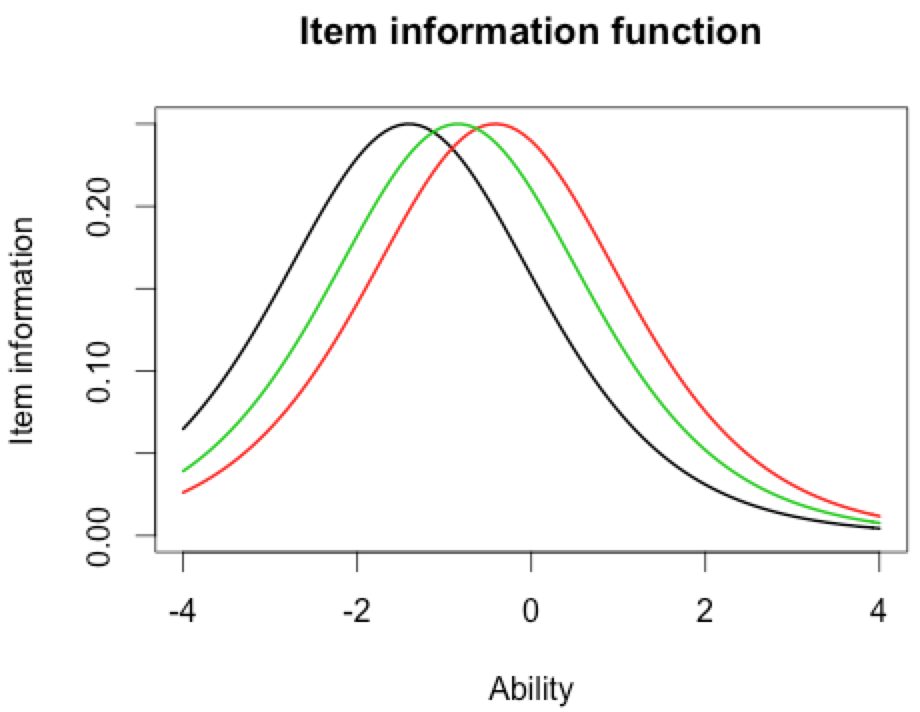
3.99 - 1.96 x 2.2 = -0,322

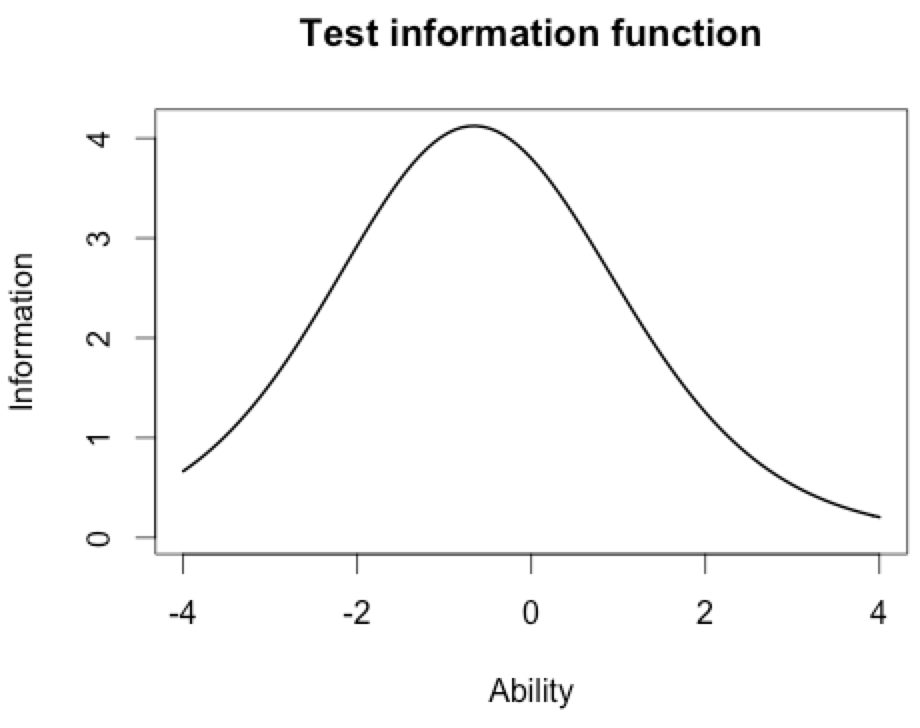
3.99 + 1.96 x 2.2 = 8.302

**2. a)** Items chosen were: 1, 7 and 17.

**b)** Item 1: Black, Item 7: Red, Item 17: Green.

plot(iif(est\_params[c(1,7,17),]), co = NA)

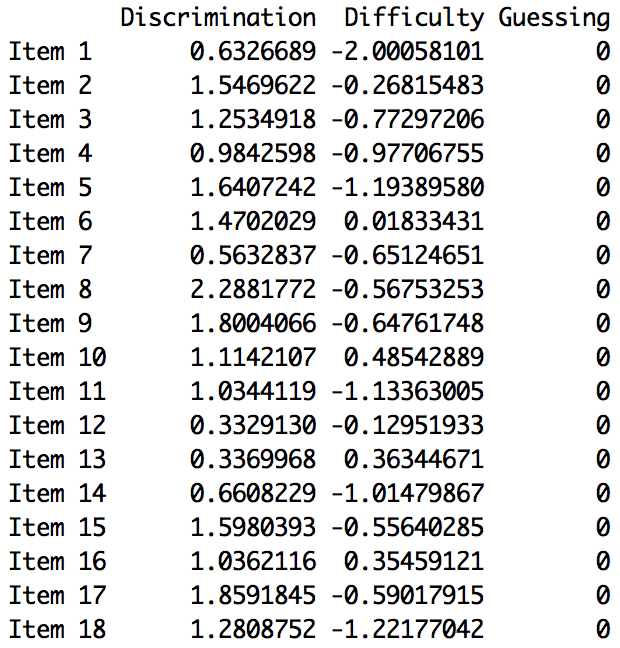
**c)** ***Same***: All the items together have the most information located between -2 and 0. ***Different***: All the items have different ability estimate.

**d)** plot(tif(est\_params))

**e)** The majority of the information is located between -2 and 1.

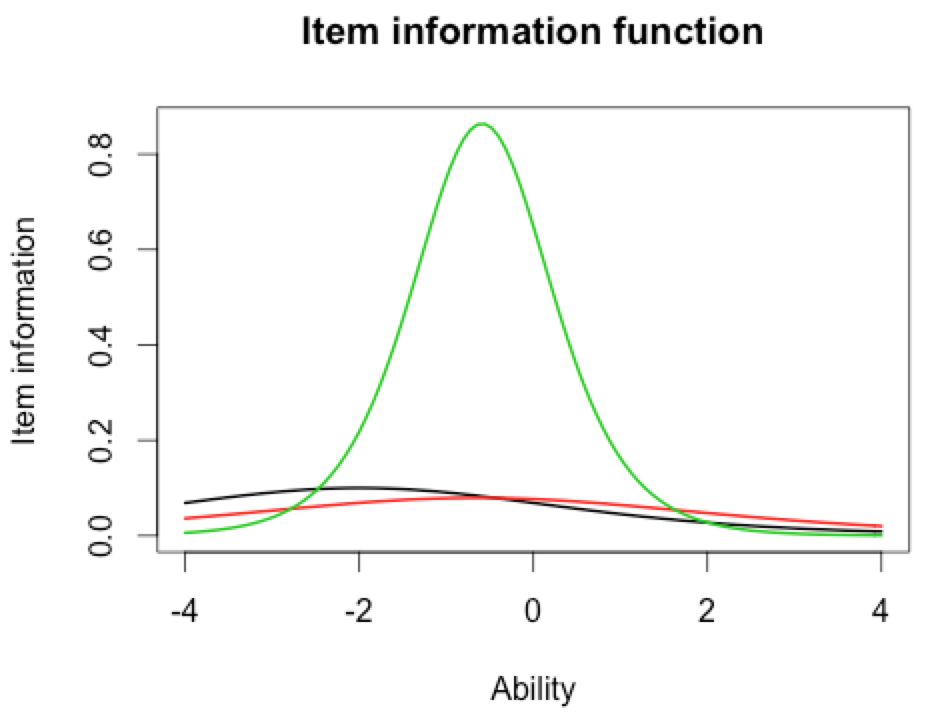
**3. a)** Item 8 had the highest discrimination 2.288 and item 12 had the lowest discrimination 0.332.

**b)** No not quite, in the 2-PL model item 1 is the easiest but item 10 is still the hardest item in both models.

****

**c)** The correlation between the Rasch model and the 2-PL model is 0.97. If you are high on ability on the Rasch model you will be high aswell in ability on the 2-PL model because the correlation between the models is very high.  
  
> cor(twopl\_abl$est,est\_abl$est)

[1] 0.9709497

**d)** > plot(iif(twopl\_params[c(1,7,17),]), co = NA)

**e)**  The items do not have the same discrimination and difficulty. In the 2-PL model we have the discriminating factor that helps us discriminate more easily between items information and ability estimate. The Rasch model only tells us about the item location/difficulty.