ST102 Class 18 – Additional exercises

1. Suppose that a random variable X has the F distribution with 1 and 8 degrees of freedom. Use the table of the t distribution to determine the value of c such that $P(X > c) = 0.20$.

2. What is the value of the median of the random variable X, such that $X \sim F_{m,n}$ when $m = n$?

3. Fill in the entries missing from the following ANOVA table.

Source	DF	SS	MS	F
Treatment	4			6.40
Error			10.60	
Total		377.36		

4. A supermarket chain investigated its profit margins over a period of 4 years. It splits its merchandise into 6 categories and recorded the profit margin for each category for each year. Among the 6 categories were meat products (average yearly profit margin 1.1%), fruit and vegetables (average yearly profit margin 1.4%), drinks (average yearly profit margin 2.5%) and cleaning products (average yearly profit margin 7.4%). The investigators constructed an ANOVA table, which is given below (some entries are missing).

Source	DF	SS	MS	F
Category		62.10		
Year				3.31
Residual			3.14	
Total				

   (a) Complete the table.

   (b) Is there a significant difference between the profit margins of different categories? What about the profit margins for different years?

   (c) Construct a 95% confidence interval for the difference between the profit margins for meat products and fruit and vegetables. Would you say there is a difference?