Course MA1S11: Michaelmas Term 2016.

Tutorial 1: Sample

October 4–7, 2016

Problem 1
Let intervals be defined as follows:—

$$I = (2, 8), \quad J = [1, 15], \quad K = [6, 12), \quad L = [11, 17].$$

Also let sets A to H be defined as follows:—

$$\begin{aligned} A &= [1, 17], \\ B &= (2, 17], \\ C &= [6, 8), \\ D &= [6, 11), \\ E &= [8, 11), \\ F &= (2, 6) \cup [11, 17], \\ G &= (2, 6) \cup [12, 17], \\ H &= (2, 8) \cup [11, 17]. \end{aligned}$$

Each of the sets tabulated below is equal to one of the sets A–H. In each row of the table below, enter the set from A–H that is equal to the specified set

$I \cup L$	
$K \setminus L$	
$(I \cup L) \setminus K$	
$J \cup (L \setminus K)$	
$(I \cup L) \cup (K \setminus L)$	
$(I \cup L) \cap (K \setminus L)$	
$(I \cup L) \setminus (K \setminus L)$	
$(K \setminus L) \setminus (I \cup L)$	

Problem 2: prove the identity

$$\sum_{j=1}^{n} \frac{4}{(3j+4)(3j+1)} = \frac{n}{3n+4}.$$

by induction on n.