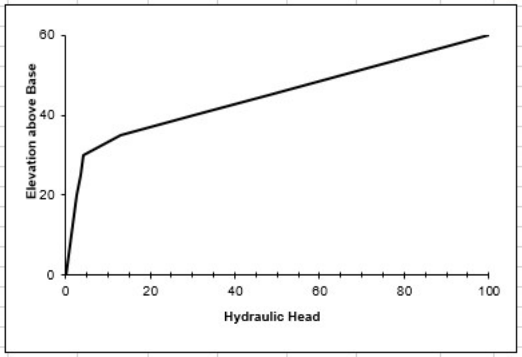
Direct solution for flux

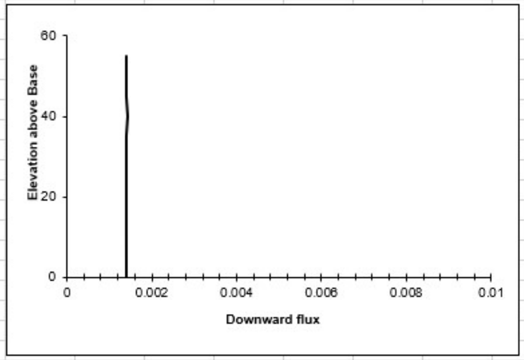
	K	num cells
zone 1	0.0004	5.5
zone 2	0.01	6.5
zone 3	0.0001	0
Keq	0.000833	
q	0.001389	

z	K zone cell	K cell	H	q	zone 1	zone 2	zone 3
60	1	4E-04	100		1	0	0
55	1	4E-04	82.6395	0.00139	1	0	0
50	1	4E-04	65.2783	0.00139	1	0	0
45	1	4E-04	47.9164	0.00139	1	0	0
40	1	4E-04	30.5542	0.00139	1	0	0
35	1	4E-04	13.1921	0.00139	1	0	0
30	2	0.01	4.16393	0.00139	0	1	0
25	2	0.01	3.46965	0.00139	0	1	0
20	2	0.01	2.77553	0.00139	0	1	0
15	2	0.01	2.08155	0.00139	0	1	0
10	2	0.01	1.38767	0.00139	0	1	0
5	2	0.01	0.69384	0.00139	0	1	0
0	2	0.01	0	0.00139	0	1	0

Map of node and cell numbers

	node	cell	
1	-		1
2	-		2
3	-		3
4	-		4
5	-		5
6	-		6
7	-		7
8	-		8
9	-		9
10	-		10
11	-		11
12	-		12
13	-		13





The Challenge:

Create a 1D, vertical steady state model with constant head top and bottom boundaries.

Show, based on the flux with depth, that the model is steady state.
Repeat this for a homogeneous and for a heterogeneous column.

Show that the steady state flux agrees with the direct calculation based on the harmonic mean average K.

Show the steady state head profile for a column with approximately equal-thickness layers with different K values.
Use this profile to explain why the equivalent hydraulic conductivity, Keq, is closer to the lower of the K values.