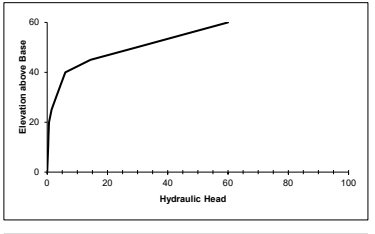
Direct solution for flux

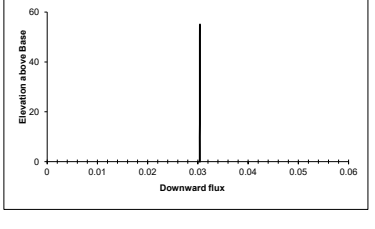
	K	num cells
zone 1	0.01	4
zone 2	0.1	4
zone 3	1	5
Keq	0.02921	
q	0.02921	

z	K zone cell	K cell	H	q	zone 1	zone 2	zone 3
60	1	0.01	60		1	0	0
55	1	0.01	44.7903	0.03042	1	0	0
50	1	0.01	29.5807	0.03042	1	0	0
45	1	0.01	14.3712	0.03042	1	0	0
40	2	0.1	6.00616	0.03042	0	1	0
35	2	0.1	4.4854	0.03042	0	1	0
30	2	0.1	2.96474	0.03041	0	1	0
25	2	0.1	1.44417	0.03041	0	1	0
20	3	1	0.60791	0.03041	0	0	1
15	3	1	0.4559	0.0304	0	0	1
10	3	1	0.30392	0.0304	0	0	1
5	3	1	0.15196	0.03039	0	0	1
0	3	1	0	0.03039	0	0	1

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.**