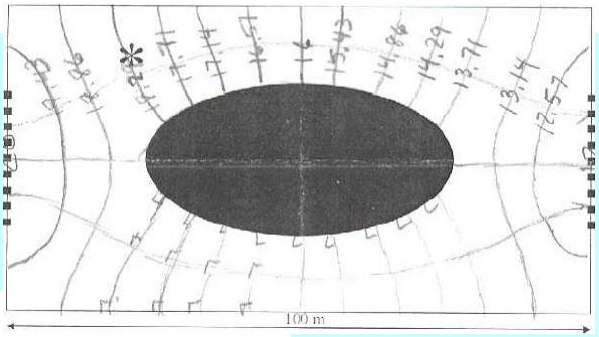
The head in the inlet reservoir on the left is 20 m and the outlet reservoir on the right is 12m. Properties of the sand are: K=1x10-3 m/s. Draw and label a flow net. Calculate the discharge through the system using units of meters and seconds. What is the head at the location of the * at the top of the tank? What is the pressure at that location?



$\frac{8}{14} = 0.57$ contour interval

$H = nq$

$14 = nd$

$\frac{nq}{nd} = 0.286$

$q = KH\frac{nq}{nd} = 1\times10^{-3}\frac{m}{s}\,8m\,\frac{4}{14} = 2.29\times10^{-3}\frac{m^2}{s}$

$Q = \text{thickness} * q = 10m\ 2.29\times10^{-3}\frac{m^2}{s}$

$= 2.29\times10^{-2}\frac{m^3}{s}$

$\sim 18.23m$

$p = \text{Head} - \text{Elevation} = 18.23m - 10m = 8.23m$

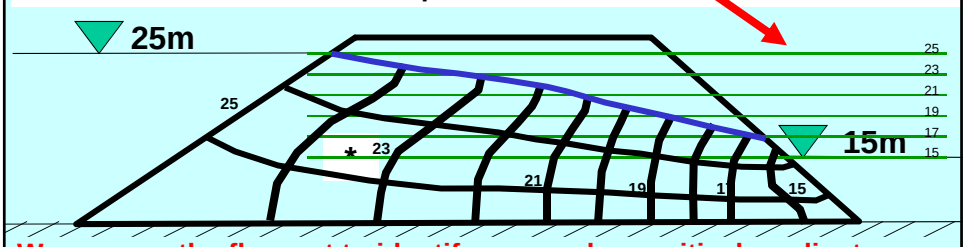
K = 0.53m/day

Draw the flow net

Calculate Q = 0.53m/day 10m 2.5 / 10 ~ 1.3 m²/day

What is the maximum gradient? ~ 1

What are the head and pressure at the *? ~ 23.5m and 8m



We can use the flow net to identify areas where critical gradients may occur and determine the magnitude of the gradient at those locations

- equipotential lines parallel constant head boundaries

-- flow lines parallel no-flow boundaries

-- streamlines are perpendicular to equipotential lines

- equipotential lines are perpendicular to no-flow boundaries

- form squares by intersecting stream and equipotential lines