PROBLEM #4 - 30 points **USE UNITS of METERS SECONDS and GRAMS**

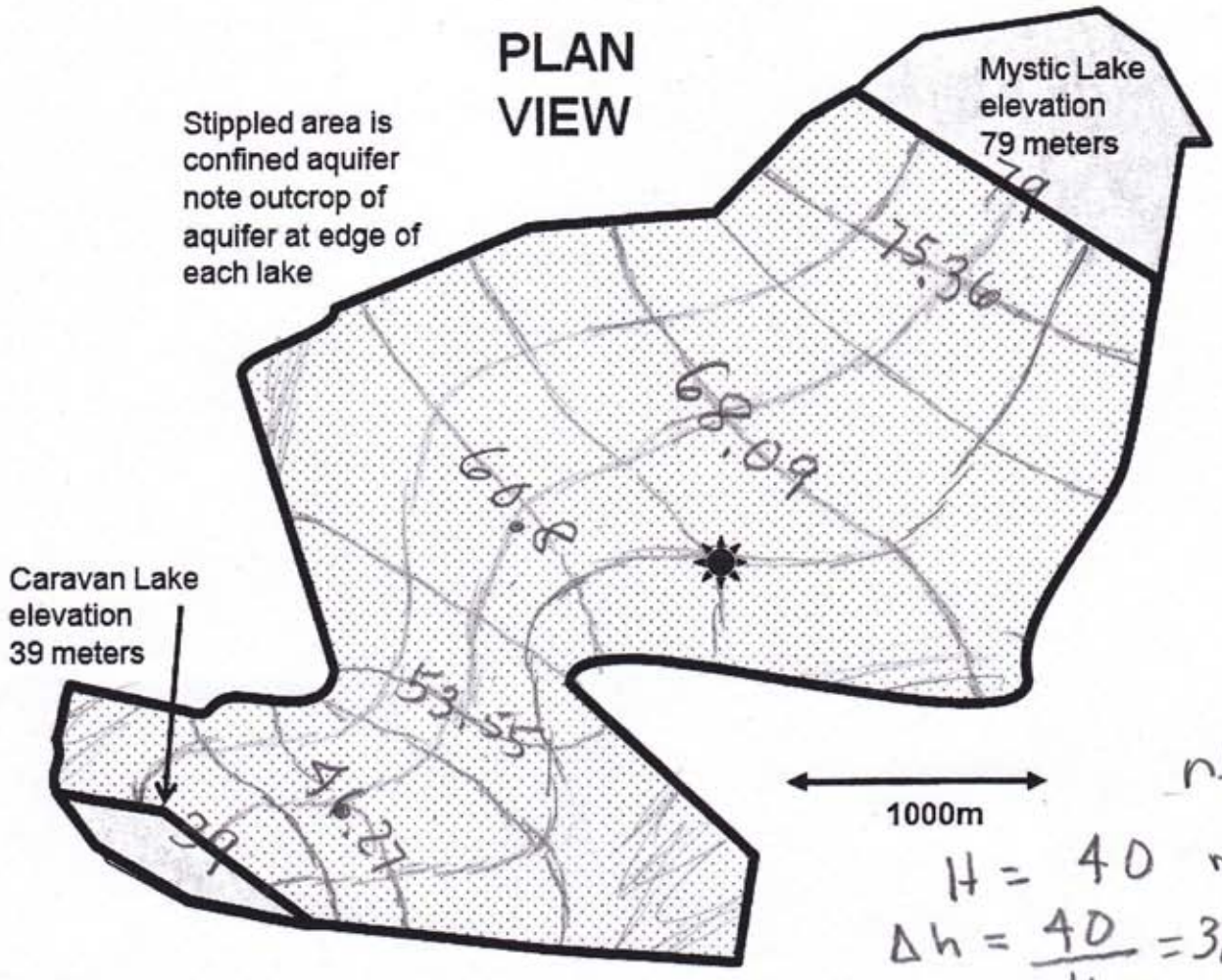
The confined aquifer illustrated in PLAN VIEW below is a uniform thickness of 13 meters.

It is underlain by low permeability bedrock and overlain by low permeability clay.

Both Mystic and Caravan lakes fully penetrate the thickness of the aquifer which has a vertical outcrop on the side of each lake (see cross-section view).

Hydraulic Conductivity of the aquifer is 5.3 cm/sec and its specific yield is 0.23.

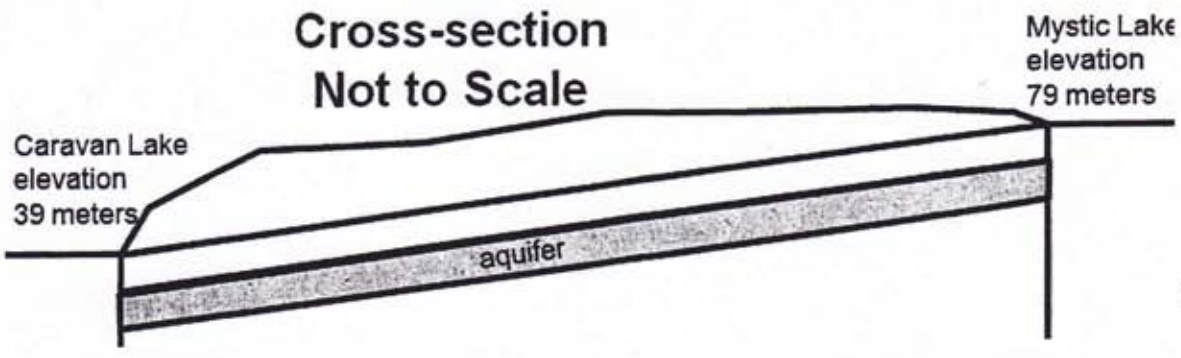
ANSWER THE QUESTIONS ON THE FOLLOWING PAGE, SHOW YOUR WORK



nf = 4

H = 40 nd = 11

$\Delta h = \frac{40}{11} = 3.636m$



PROVIDE CALCULATIONS AND ANSWERS TO PROBLEM 4 HERE

USE UNITS of METERS SECONDS and GRAMS

4a) Draw a PLAN VIEW flow net ON THE PLAN VIEW ON THE PREVIOUS PAGE and label the equipotential lines

see previous page

4b) The ground elevation at the ✸ is 83m. What is the depth to water in the confined aquifer?

$h* = 64.45m$

depth to water $83_m - 64.45_m = 18.55_m$

4c) The well at the ✸ detected the bottom of the aquifer at 50m below ground surface. What is the pressure at the bottom of the aquifer?

elev bottom $= 83_m - 50_m = 33m$

$h_p = h_T - h_e = 64.45m - 33m = 31.45m$

4d) Consider a drop of water in the confined aquifer that passes through the x,y location of the ✸. How many DAYS does it take that drop to travel from Mystic Lake to Caravan lake?

$$\text{Time} = \frac{\text{distance}}{\text{velocity}} = \frac{5000m}{\frac{0.053\frac{m}{s}\ \frac{40m}{5000m}}{0.23}} = 2.7\times10^6 sec$$

~ 31.4 days

4e) What is the volumetric flow rate from the confined aquifer to Caravan Lake?

$Q = K H \frac{nf}{nd}$ thickness

$= 0.053\frac{m}{s}\ 40m\ \frac{4}{11}\ 13m = 10.02\frac{m^3}{s}$