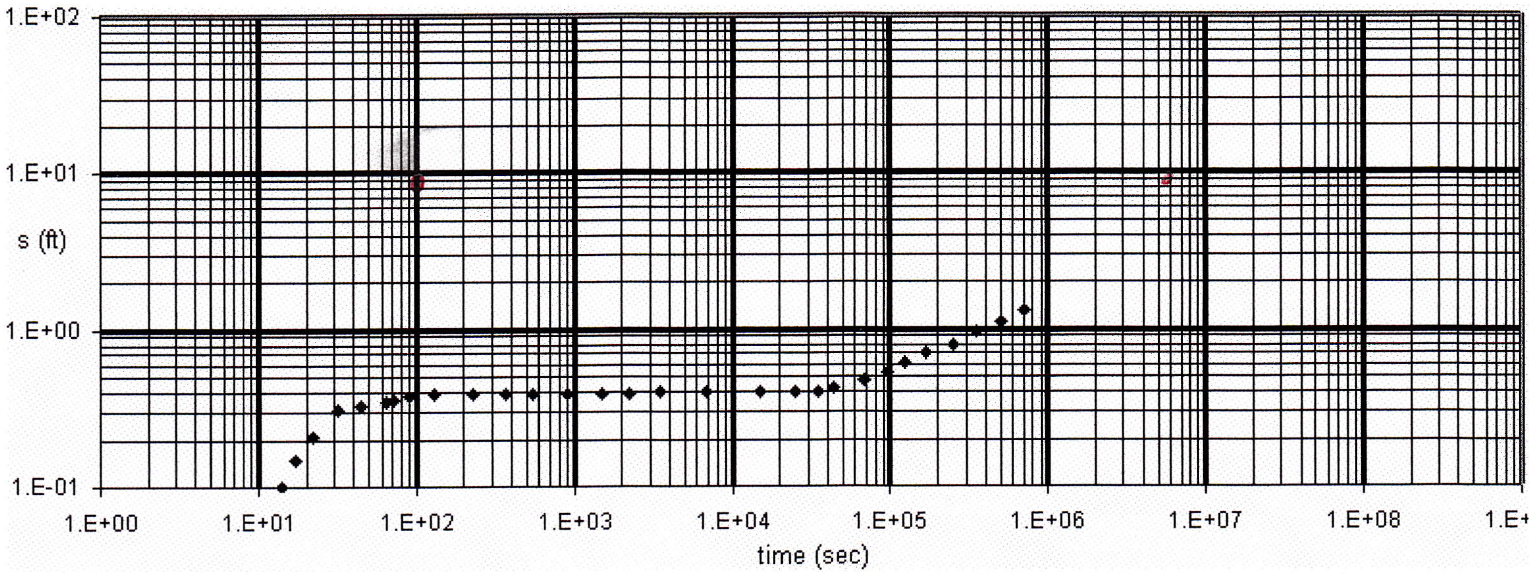
PROBLEM #2 – 30 points **USE UNITS of FEET SECONDS**

ANSWER THE QUESTION ON THE FOLLOWING PAGE, SHOW YOUR WORK

USE UNITS of FEET SECONDS

An aquifer test was conducted and data are shown below. The fully penetrating observation well was 190 ft from the pumping well. Initial saturated thickness of the aquifer was = 88 ft. The pumping rate was 35 GPM which is 0.078 ft^3/sec. Tell me everything you can about the aquifer using these data.



$\Gamma = 4$

$W(u) = 1 \quad s = 9$ ft

$1/4u_a = 1 \quad t = 100$ s $\quad u_a = 0.25$

$1/4u_b = 1 \quad t = 6 \times 10^6$ s $\quad u_b = 0.25$

$\Gamma = 4$

PROVIDE CALCULATIONS AND ANSWERS TO PROBLEM 2 HERE

$W(u) = 1 \quad u_a = 0.25$

$s = 9ft \quad t = 100s$

USE UNITS of FEET SECONDS **SHOW YOUR WORK!!!!**

$u_b = 0.25$

$t = 6 \times 10^6 s$

$S = \dfrac{Q\,W(u)}{4\pi t}$

$$T = \frac{Q\,W(u)}{4\pi s} = \frac{0.078\ ft^3/sec \cdot 1}{4\pi\ 9ft} = 7\times10^{-4}\ \frac{ft^2}{s}$$

$$K = \frac{T}{b} = \frac{7\times10^{-4}\ \frac{ft^3}{s}}{88\ ft} = 7.8\times10^{-6}\ \frac{ft}{s} \sim 8\times10^{-6}\ \frac{ft}{s}$$

$u = \dfrac{r^2 S}{4Tt}$

$$S = \frac{u_a 4 T t_a}{r^2} = \frac{0.25 \cdot 4 \cdot 7\times10^{-4}\frac{ft^2}{s} \cdot 100s}{(190ft)^2} = 1.9\times10^{-6} \cong 2\times10^{-6}$$

$$S_y = \frac{u_b 4 T t_b}{r^2} = \frac{0.25 \cdot 4 \cdot 7\times10^{-4}\frac{ft^2}{s} \cdot 6\times10^6 s}{(190ft)^2} = 0.116 \cong 0.12$$

$\Gamma = \dfrac{K_v r^2}{K_h b^2}$

$$K_v = \frac{\Gamma K_h b^2}{r^2} = \frac{4\left(8\times10^{-6}\frac{ft}{s}\right)(88ft)^2}{(190ft)^2} = 6.9\times10^{-6}\ \frac{ft}{s}$$

or $7\times10^{-6}\ \frac{ft}{s}$

possible 1 alternate match

$\Gamma = 2$

$W(u_a) = 1 \quad u_a = 0.25$

$s = 3ft \quad t = 80\ sec$

$u_b = 0.25$

$t = 1.9\times10^6 sec$

$T = 2\times10^{-3}\ f^2/s$

$K_H = 2\times10^{-5}\ f/s$

$S = 2\times10^{-6}$

$S_y = 0.11$

$K_v = 1\times10^{-5}\ f/s$