Petroleum Engineering 311
Test 11

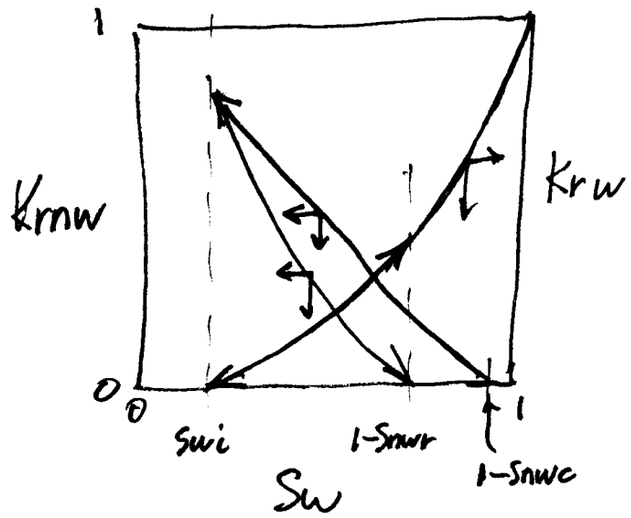
April 2, 2003

1. Define effective permeability to water in words and with an equation.

Effective permeability to water is the water conductivity of the rock-fluid system when the system contains hydrocarbons and water. It is an intensive property of the system and is given by

$$k_w = \frac{q_w \mu_w}{A \phi_w} \frac{L}{A}$$ for linear systems.

2. Sketch the graph(s) of relative permeability to the wetting and non-wetting phases vs wetting phase saturation. Show the hysteresis effect. Clearly label the axes of your graph(s) and end-points.



Notes
- strongly wet system
- $k_{base} = k_{abs}$

3. Suppose the following data on permeability (md) are available from a drainage laboratory-flow test. Calculate relative permeability to oil and water if the "base permeability" is the absolute permeability?

S_w	k_w	k_o
0.2	0	80
1.0	100	0

S_w	k_{rw}	k_{ro}
0.2	0	0.8
1.0	1.0	0