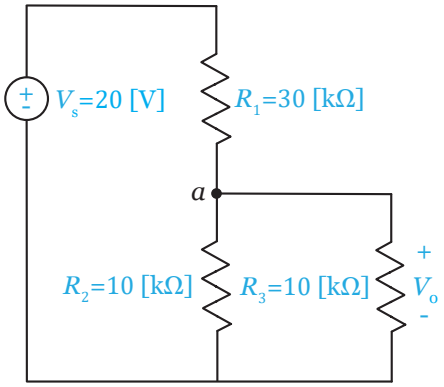
MEMS 0031 - Electrical Circuits
Quiz #3

Name: _____

Problem #1

Given the potentiometer shown below, determine the output voltage V_o.



Solution:

There are two 10 [kΩ] resistors in parallel, which creates an equivalent of

$$R_{eq,1} = \frac{(10\,[\text{k}\Omega]) \cdot (10\,[\text{k}\Omega])}{(10\,[\text{k}\Omega]) + (10\,[\text{k}\Omega])} = 5\,[\text{k}\Omega]$$

Those two 10 [kΩ] resistors have the same voltage potential, therefore V_o is simply voltage division of the the 30 [kΩ] and $R_{eq,1}$ resistors

$$V_o = \frac{5\,[\text{k}\Omega]}{30\,[\text{k}\Omega] + 5\,[\text{k}\Omega]} 20\,[\text{V}] = 2.86\,[\text{V}]$$