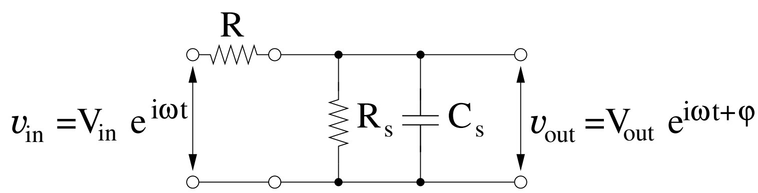
Name: ____

There are **two questions** to complete.

1.



(a) Determine the effective complex impedance $Z_{||}$ of the parallel combination of R_s and C_s.

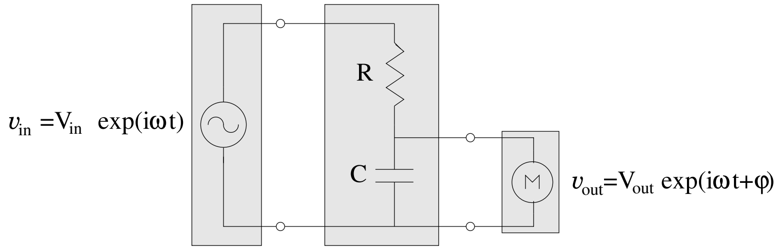
Now assume you can measure R_s and choose R, in the circuit shown above, such that $R = R_s$. Assume furthermore that you can measure and vary the frequency f of the input signal such that the magnitude of the capacitor's impedance equals the resistance, $|Z_C| = R = R_s$.

(b) Determine the ratio of the amplitudes V_{out} and V_{in}, *i.e.* the ratio of $|v_{out}|$ and $|v_{in}|$.

(c) What is the value of the capacitance C_s in terms of the measured quantities R and f?

2.

f (kHz)	$V_{out}(V)$
0	10.0
10	10.0
50	8.90
100	7.11
200	4.49
300	3.16



Given $R = 1$ kΩ and V_{in}=10 V, graph the above data on a straight line plot and determine the value of the capacitance C.