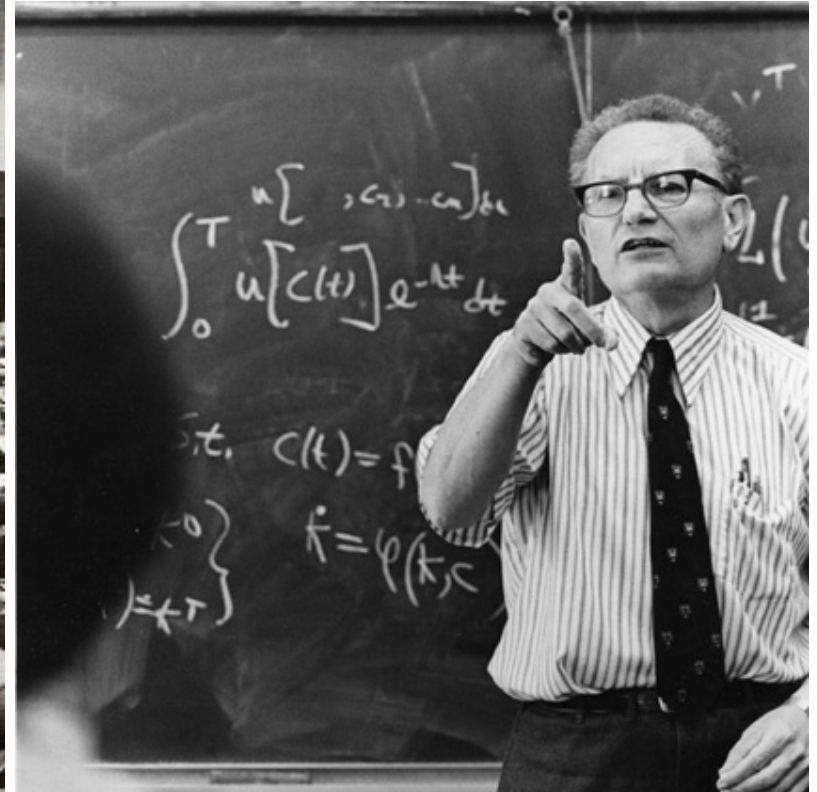
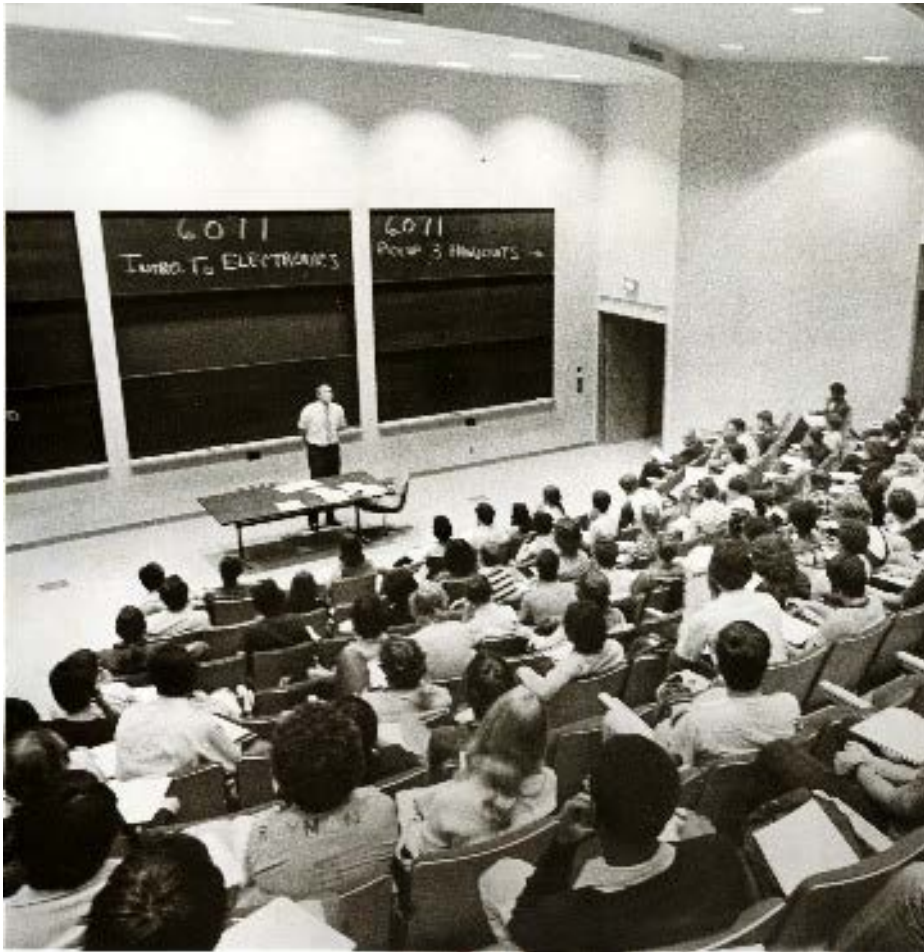
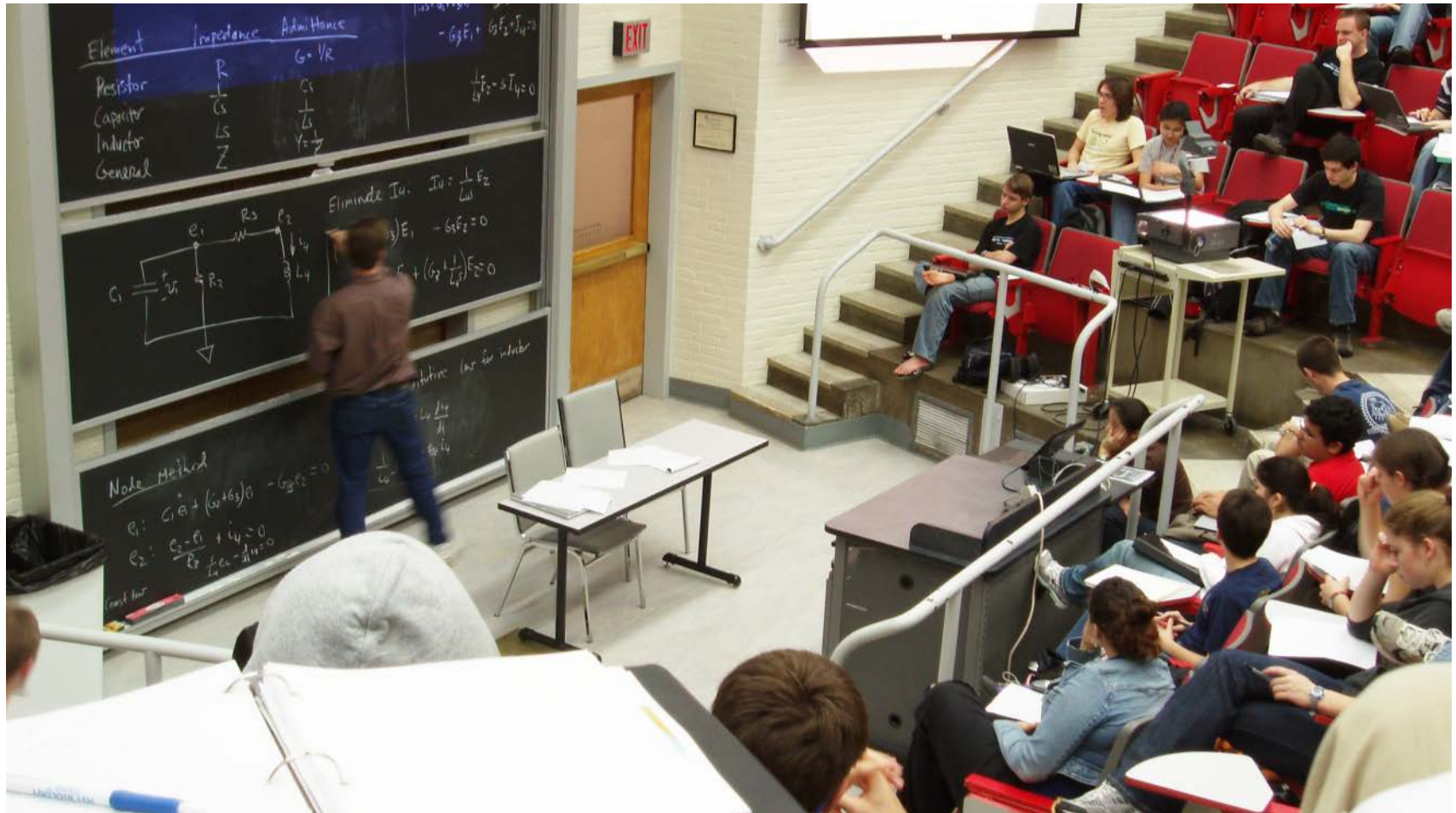




REINVENTING EDUCATION

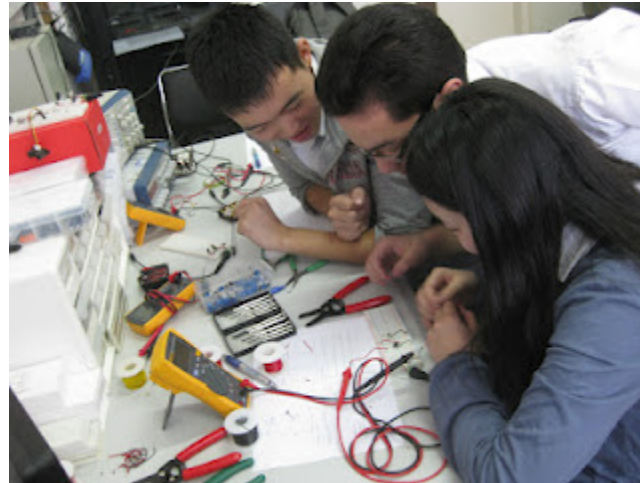
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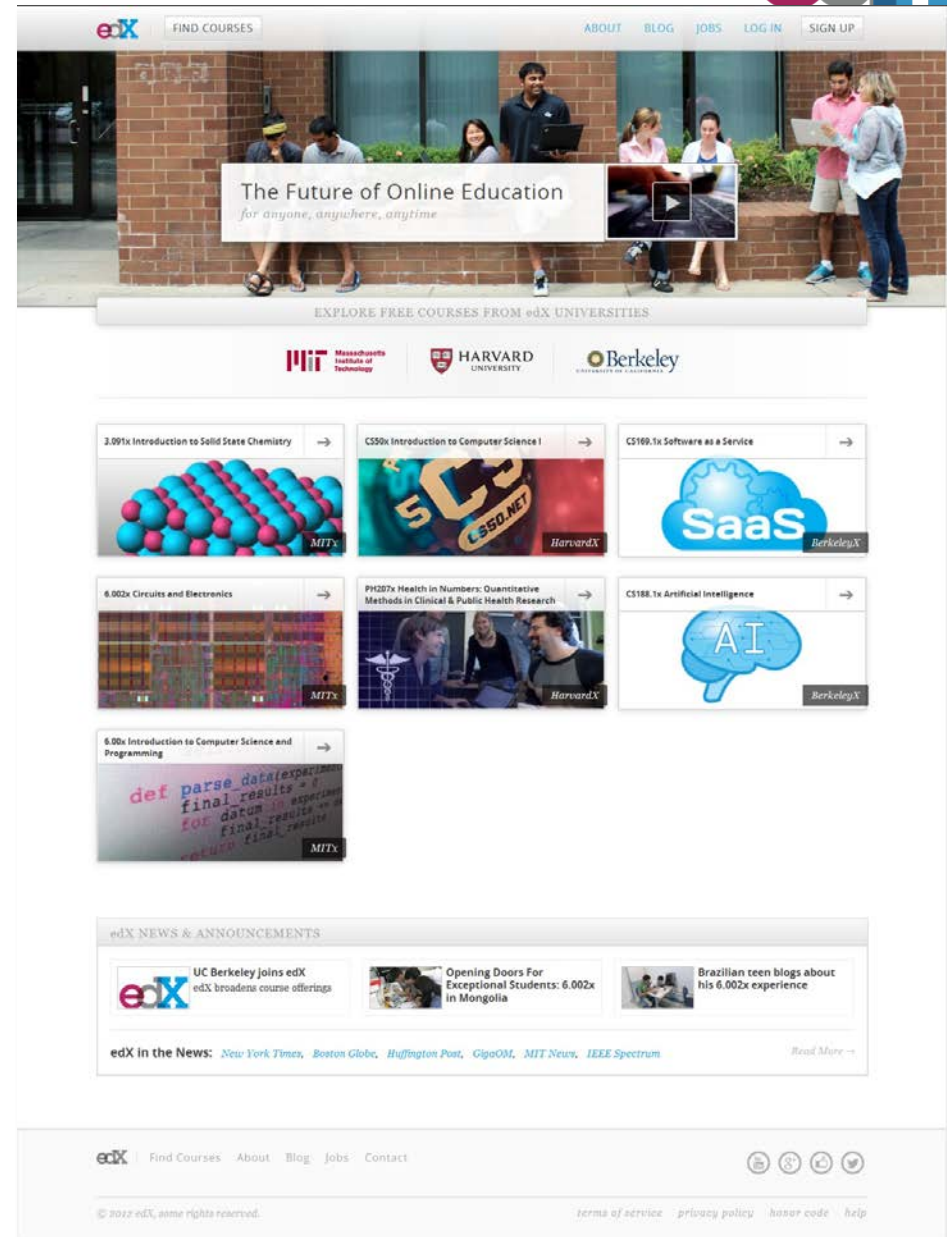
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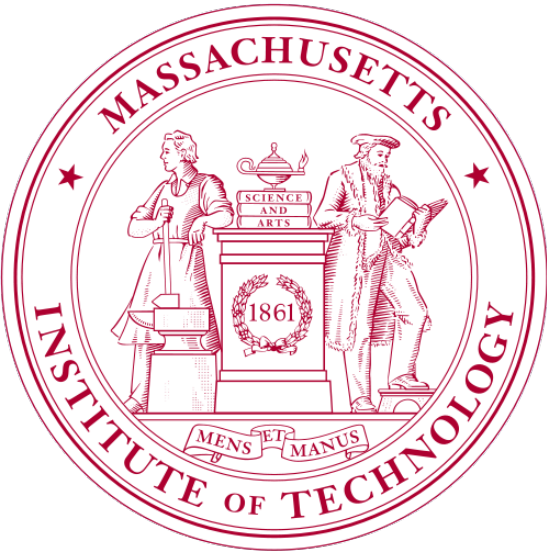
X universities get access to data
for research

Production support for high
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**Harvard and MIT have committed \$60M to the venture*



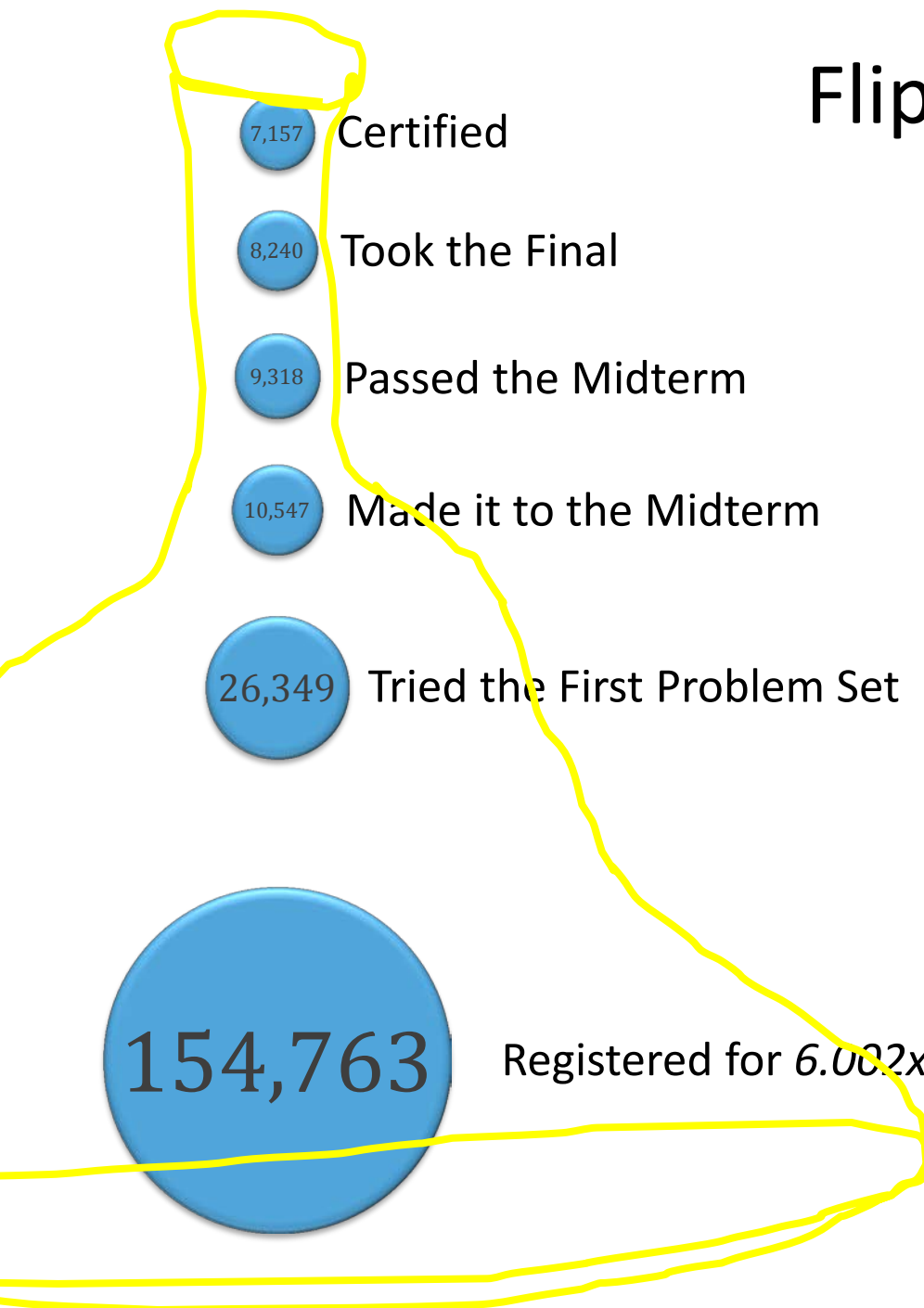
To expand access to education for students
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Admitted: ~1600

Applied to MIT's Class of 2015: ~18,000

Flipping the funnel



*Same staff
resources as
150 person
on-campus
class*

Focus on efficiency not cost

$$\text{Efficiency} = \frac{\text{Quality}}{\text{Cost}}$$

Courseware – MITx 6.002x

https://6002x.mitx.mit.edu/courseware/6.002_Spring_2012/Week_9/Undamped_Second-Order_Systems/#

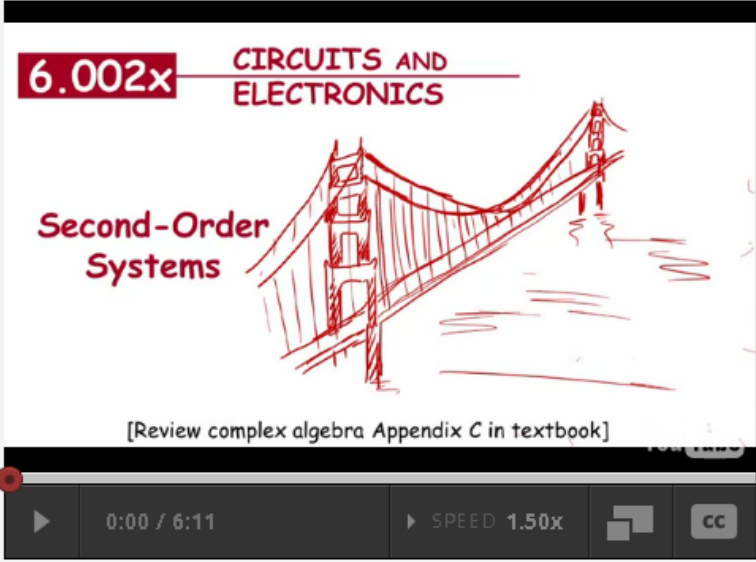
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- Week 2
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 - Mosfet Amplifier
Lab due April 15
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Tutorial Index
- Week 6

S17V1: Motivating Example



6.002x **CIRCUITS AND ELECTRONICS**

Second-Order Systems

[Review complex algebra Appendix C in textbook]

SPEAKER : Now let's move on to second-order systems.

So far you looked at first-order systems that contained a single energy storage element such as a capacitor.

So a circuit containing a voltage source, a capacitor, and a resistor was a first-order circuit.

these circuits, you will have two independent

0:00 / 6:11 SPEED 1.50x CC

Textbook Discussion



**Great lectures were theater,
but the future is in games**

Instant feedback

Courseware - MITx 6.002x <https://6002x.mitx.mit.edu/>

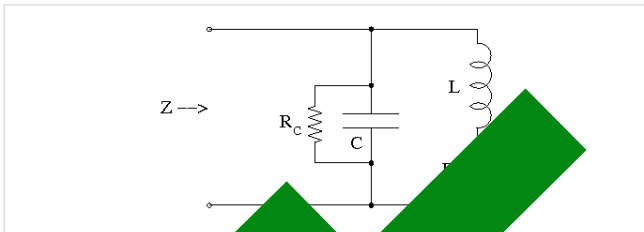
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H11P1: LC TANK

Parallel resonant "tank" circuits are common in radio equipment. But unfortunately there is always resistance that prevents them from being perfect: in every real inductor, the wire that makes up the inductance has some resistance, and there may be leakage in the capacitor that can be modeled as a resistance. Also, the Norton resistance of the system connected to the tank circuit looks like a leakage through the capacitor. So a realistic model for a tank circuit is the following:



In the space provided below write an algebraic expression for the bandwidth $\Delta\omega$ of the impedance Z looking into the device parameters for the

The antenna tank of a Graymark 536 Radio Kit has an inductance $L \approx 0.65\text{mH}$. The resistance of the inductor $R_L \approx 4.0\Omega$. The equivalent resistance across the capacitor is $R_C \approx 490.0\text{k}\Omega$. The capacitor is variable, for tuning.

If we tune to a station at $f = 950.0\text{kHz}$ what is the capacitance, in picoFarads, of the tuning capacitor?

What is the bandwidth, in kHz, of the tank at $f = 950.0\text{kHz}$?

If next we tune to a station at $f = 1480.0\text{kHz}$ what is the capacitance, in picoFarads, of the tuning capacitor?

What is the bandwidth, in kHz, of the tank at $f = 1480.0\text{kHz}$?

So it is apparent that this is not the only circuit in the radio that selects the desired station from stations on adjacent channels.

Show Answer



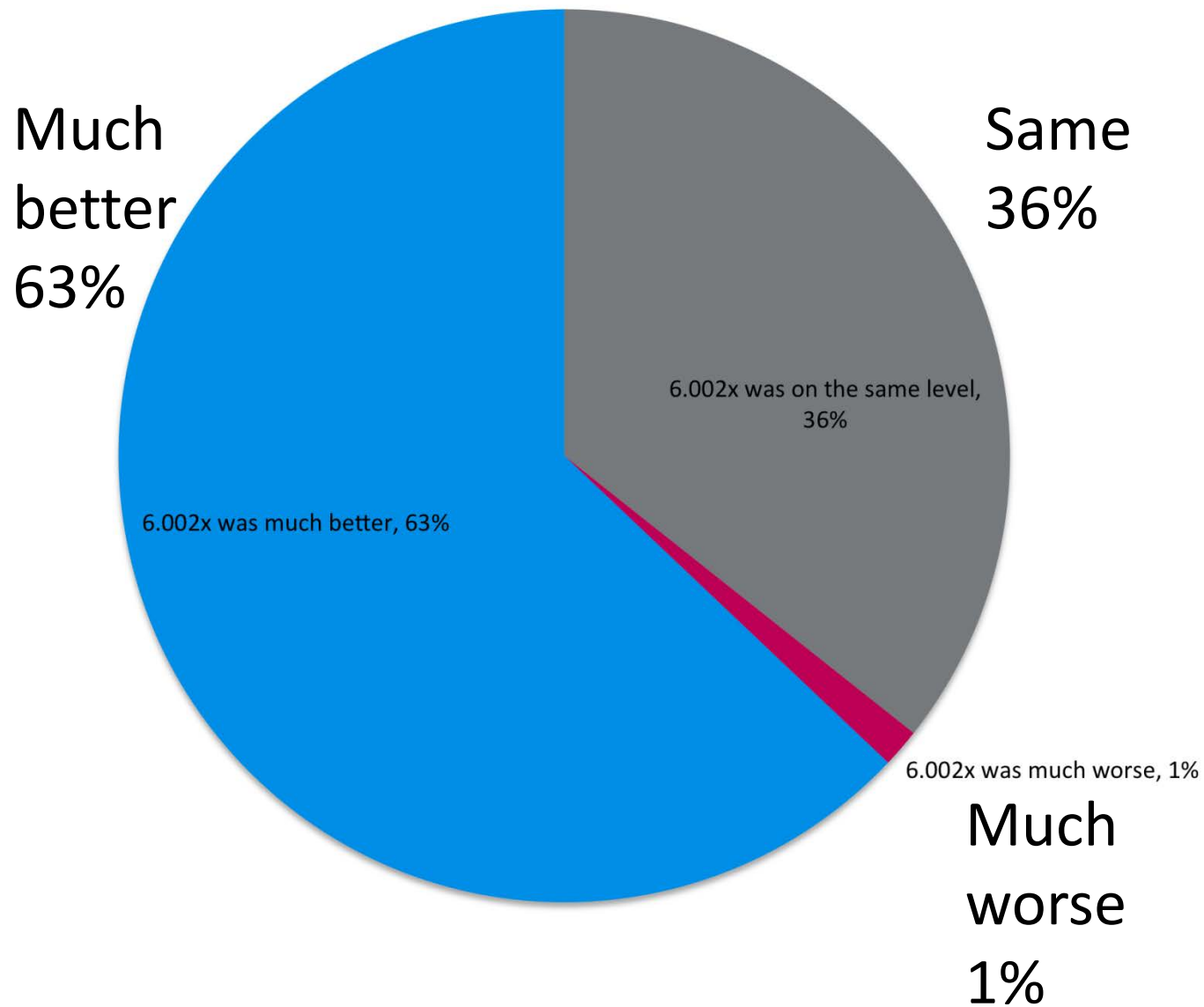
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Oh god; have I missed you... :~}

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