This turns 9V into +/- 4.5v
\[ V_o = V_i \frac{R_2}{R_1 + R_2} = 9V \frac{10k}{10k + 10k} = 4.5V \]

Stage 1 Gain
\[ \text{gain} = 1 + \frac{100k}{33k} = 4.03x \]

Stage 2 Gain Calculation
\[ \text{gain} = \frac{R_8}{R_7} = \frac{220k}{1k} = 220x \]

But.. In reality it's lower due to roll off:
\[ \text{only 174x at peak} \]

\[ \text{gain} = 1 + \frac{100k}{33k} = 4.03x \]

Stage 3 Gain
Speaker Amp default
20x

Total Gain
Headphone Out = \( 4 \times 174 \times 20 = 13,920x \)
Speaker = \( 4 \times 174 \times 20 = 13,920x \)

Backyard Brains
SpikerBox v. 1.3c
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