

Absorption Equations:

For 1000 Hz, find R given the information below:

<u>S, ft²</u>	<u>α</u>	<u>S x α</u>
100	0.5	50.0
10	0.02	0.2
120	0.1	12.0
Total = 230		62.2

$$\bar{\alpha} = \frac{\sum_1^N S_i \alpha_i}{\sum_1^N S_i} = \frac{62.2}{230} = \boxed{0.27}$$

$$R = \frac{S \bar{\alpha}}{1 - \alpha} = \frac{230.0}{0.73} \cdot 0.27 = \boxed{85.3}$$

Transmission Loss Example:

Find transmission loss based on the TL for each S below:

<u>S, ft²</u>	<u>TL, dB</u>	<u>S x 10^{-TL/10}</u>
100	20	1.00
10	0	10.00
120	15	3.79
Total = 230		14.79

$$TL_{combined} = 10 \log \left\{ \frac{\left[\sum_1^n S_i \right]}{\sum_1^n S_i (10^{-TL_i/10})} \right\} = 10 \log \left\{ \frac{(100+10+120)}{100(10^{-20/10}) + 10(10^{-0/10}) + 120(10^{-15/10})} \right\}$$

$$= 10 \log \left(\frac{230}{14.79} \right) = \boxed{11.9 \text{ dB}}$$