The difference in actual sound pressure for an increase from 50 to 100 dB(A)

Sound Pressure for 50 dB(A)

\[ dB(A) = 20 \times \log\left(\frac{\text{sound pressure}}{\text{sound pressure at 0 dB(A)}}\right) \]
\[ 50 \text{ dB(A)} = 20 \times \log\left(\frac{\text{sound pressure}}{20}\right) \]
\[ \frac{50}{20} = \log\left(\frac{\text{sound pressure}}{20}\right) \]
\[ 2.25 = \log\left(\frac{\text{sound pressure}}{20}\right) \]
\[ 10^{2.25} = \text{sound pressure/20} \]
\[ 316.228 \times 20 = \text{sound pressure} = 6324.55 \text{ micro pascals at 50 dB(A)} \]

Sound Pressure for 100 dB(A)

\[ dB(A) = 20 \times \log\left(\frac{\text{sound pressure}}{\text{sound pressure at 0 dB(A)}}\right) \]
\[ 100 \text{ dB(A)} = 20 \times \log\left(\frac{\text{sound pressure}}{20}\right) \]
\[ \frac{100}{20} = \log\left(\frac{\text{sound pressure}}{20}\right) \]
\[ 5 = \log\left(\frac{\text{sound pressure}}{20}\right) \]
\[ 10^5 = \text{sound pressure/20} \]
\[ 100,000 \times 20 = \text{sound pressure} = 2,000,000 \text{ micro pascals at 100 dB(A)} \]

Sound pressure multiplier from 50 to 100 dB(A)

\[ \frac{2,000,000}{6324.55} = 316 \text{ times louder} \]