$$s = \frac{1}{2} a t_{fall}^2 \; ; \quad v_{schall} = \frac{s}{t_{schall}} = 330 \frac{m}{s} \; ; \; t_g = t_{fall} + t_{schall} = 4{,}3s$$

geg:

$$a = 9{,}81 \frac{m}{s^2}$$

ges: s = ?

Rechnung: $v_{schall} t_{schall} = s$

$$s = \frac{1}{2} a t_{fall}^2 = v_{schall} t_{schall} \qquad ; \; t_{schall} = t_g - t_{fall}$$

$$\frac{1}{2} a t_{fall}^2 = v_{schall} (t_g - t_{fall})$$

$$\frac{1}{2} a t_{fall}^2 - v_{schall} (t_g - t_{fall}) = 0$$

$$\frac{1}{2} a t_{fall}^2 + v_{schall} t_{fall} - v_{schall} t_g = 0$$

$$t_{fall}^2 + \frac{2}{a} v_{schall} t_{fall} - \frac{2}{a} v_{schall} t_g = 0 \qquad ; \text{pq-Formel}$$

$$t_{fall} = -\frac{v_{schall}}{a} \pm \sqrt{(\frac{v_{schall}}{a})^2 + \frac{2}{a} v_{schall} t_g}$$

$$t_{fall} = 4{,}06s$$

$$s = \frac{1}{2} a t_{fall}^2 = 80{,}8m$$