

P112 Free fall sheet # 3

A student drops a stone into a mine shaft that is 250 m deep. How long will it be before she hears the stone strike bottom ($v_{\text{sound}} = 342 \text{ m/s}$)

$a = -9.81$
 $d = -250$
 $v_f = ?$
 $v_i = 0$
 sound

$d = \frac{1}{2}at^2$
 $t = \sqrt{\frac{d}{\frac{1}{2}a}} = \sqrt{\frac{-250}{\frac{1}{2}(-9.81)}} = 7.145$

$t = \frac{d}{v}$
 $= \frac{250}{342 \text{ m/s}} = 0.73$

$7.145 + 0.73 = 7.875$

Mar 13-9:51 AM