Answer on Question #69578, Physics / Molecular Physics | Thermodynamics

Question: You throw a small rock straight up from the edge of a highway bridge that crosses a river. The rock passes you on its way down, 9.00 s after it was thrown. What is the speed of the rock just before it reaches the water 25.0 m below the point where the rock left your hand? Ignore air resistance.

Solution:

$$v_{samelevel} = \frac{gt_{pass}}{2} = 44.1\frac{m}{s}$$

$$h = \frac{v^2 - v_{samelevel}^2}{2g} \rightarrow v = \sqrt{2gh + v_{samelevel}^2} = 49.3\frac{m}{s}$$

Answer: $49.3\ m/s$

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