Question

From rest: $v_0 = 0$. Time falling: $t = 2$ s. The impact velocity: $v = v_0 + g \cdot t = 0 + 9.8 \cdot 2 = 19.6 \text{ m} \cdot \text{s}^{-1}$.

The height of a well: $h = v_0 \cdot t + \frac{g \cdot t^2}{2} = 0 \cdot 2 + \frac{9.8 \cdot 4}{2} = 19.6 \text{ m}$.

If we need time $t = 1$ s: $h = v_0 \cdot t + \frac{g \cdot t^2}{2} = 19.6 \text{ m} \Rightarrow v_0 = \frac{h - \frac{g \cdot t^2}{2}}{t} = \frac{19.6 - \frac{9.8 \cdot 1}{2}}{1} = 14.7 \text{ m} \cdot \text{s}^{-1}$.

The impact velocity: $v = v_0 + g \cdot t = 14.7 + 9.8 \cdot 1 = 24.5 \text{ m} \cdot \text{s}^{-1}$.

Answer: the distance down to the water is 19.6 meters. The stone must be thrown downwards with the speed $14.7 \text{ m} \cdot \text{s}^{-1}$ in order to hit the surface of the water after 1 second. The impact velocity in two cases are $19.6 \text{ m} \cdot \text{s}^{-1}$ and $24.5 \text{ m} \cdot \text{s}^{-1}$.