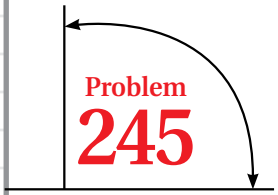
problem corner



by Benjamin Bloch, Ph.D.

I used a Uniform Acceleration Motion illustrative problem in the Problem-solving Method article, January 2012 issue (page 39).

Reader Miles Abernathy correctly pointed out that, from his caving experience (wow), a more accurate analysis would include the time required for the sound of the rock to be recorded, and that should be included in the analysis. Another reader, Dr. Albert H. Barnes, also correctly detailed that in an actual problem, both sound and well-construction specifics must be investigated.

In this problem we will therefore include the effects of sound, using a sound speed of v_s = 343 m/s for the additional "Given" datum.

A rock is dropped into a well, and its sound is heard 8.1 seconds later. If the speed of sound is 343 m/s,

1. How deep is the well? How does this differ from the non-sound calculation of 321.5 m depth?
2. What is the time travel for the rock to hit the water?
3. What is the sound time interval from splash the recording?

N.B. Take care when calculating the square root of the difference between two nearly equal large numbers.