

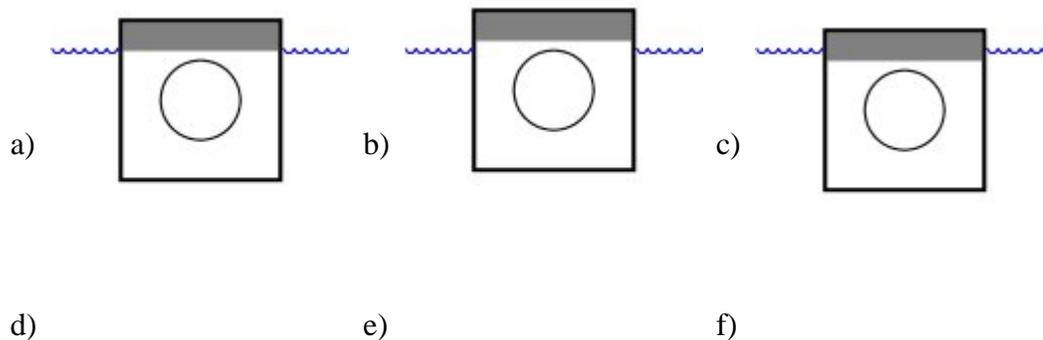
Question #277

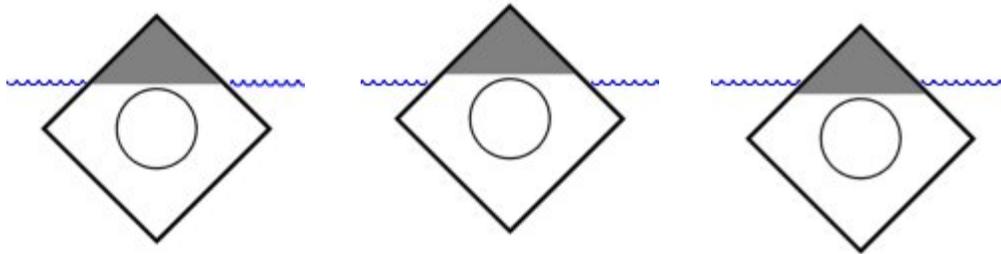
A long, symmetric square bar floats in a bath of methyl alcohol, with its sides horizontal and vertical, as shown in the photograph below.



Now, what we will do is to add *water* so that the density of the bath is significantly increased, to nearly that of water. The question is, "What will the bar do?" In particular, what position will the bar assume after a lot of water is added. In effect, here we will be decreasing the density of the bar as it floats in a fluid with a constant density. In case you might wish to know, the effective change in density of the bar relative to liquid in which it is floating is equivalent to a change of the ratio of the density of the bar to that of the liquid from slightly above 0.75 to slightly below 0.75. This problem is asking how the orientation of a long square bar floating in water will change as its specific gravity changes from above 0.75 to below 0.75.

Below are several possibilities for the position of the bar after the initial methyl alcohol bath has been largely replaced by water. Which one will most nearly match the position of the long square bar after the methyl alcohol bath has been replaced by water? Note that the gray areas marked on all of the pictures represent the same fraction of the cross-sectional area of the bar.





Which of the drawings most nearly represents the final position of the square bar?

- (a)
- (b)
- (c)
- (d)
- (e)
- (f)
- (g) none of the above.
- (h) the bar will sink.

Click here for [Answer #277](#) after March 12, 2003.

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For questions and comments regarding the *Question of the Week* contact [Dr. Richard E. Berg](#) by e-mail or using phone number or regular mail address given on the [Lecture-Demonstration Home Page](#).