


← **Physics 205 Spring 2023 TTH, section 44832, Spring 2023**

 **INSTRUCTOR**
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 Sierra College,
 CA

Physics 205 Homework for Archimedes Lab (Homework)

Current Score

QUESTION	1	2	3	4	5	6	7	8
POINTS	2.5/2.5 ✓	2.5/2.5 ✓	1.25/2.5	0/2.5	0/2.5	0/2.5	0/2.5	0/2.5

TOTAL SCORE

6.25/20

31.3%

SUBMISSIONS USED

24/100

Due Date

MON, MAR 6, 2023
 11:59 PM PST

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Instructions

These problems are from chapter 14 and deal with fluids, as discussed in lab. Paper submissions and answers to essay questions are not required.

Assignment Submission & Scoring

Assignment Submission

For this assignment, you submit the entire assignment.

Assignment Scoring

Your last submission is used for your score.

1. [2.5/2.5 Points]

[DETAILS](#)[PREVIOUS ANSWERS](#)

SERPSE7 14.CQ.007.

[MY NOTES](#)[ASK YOUR TEACHER](#)

An apple is held completely submerged just below the surface of water in a container. The apple is then moved to a deeper point in the water. Compared with the force needed to hold the apple just below the surface, what is the force needed to hold it at the deeper point?

- ☐ smaller
- ☐ larger
- ☒ the same
- ☐ impossible to determine



2. [2.5/2.5 Points]

DETAILS

PREVIOUS ANSWERS

SERPSE7 14.CQ.015.

MY NOTES

ASK YOUR TEACHER

Rank the buoyant forces exerted on the following seven objects, from the largest to the smallest. Assume the objects have been dropped into a swimming pool and allowed to come to mechanical equilibrium. If any buoyant forces are equal, state that in your ranking. Use only '>' or '=' symbols. If any elements are equal, show their equality in alphabetic order - for example: $a>b=c$.

- (a) a block of solid oak
- (b) an aluminum block of equal volume to the wood
- (c) a beach ball made of thin plastic and inflated with air, of equal volume
- (d) an iron block of equal volume
- (e) a thin-walled, sealed bottle of water equal in volume to the wood
- (f) an aluminum block having the same mass as the wood
- (g) an iron block of equal mass.

 ✓

3. [1.25/2.5 Points]

DETAILS

PREVIOUS ANSWERS

SERPSE7 14.P.006.

MY NOTES

ASK YOUR TEACHER

PRACTICE ANOTHER

(a) Calculate the absolute pressure at an ocean depth of 950 m. Assume the density of sea water is 1023 kg/m³ and that the air above exerts a pressure of 101.3 kPa.

 ✓ Pa

(b) At this depth, what force must the frame around a circular submarine porthole having a diameter of 32.0 cm exert to counterbalance the force exerted by the water?

 ✗

Your response is within 10% of the correct value. This may be due to roundoff error, or you could have a mistake in your calculation. Carry out all intermediate results to at least four-digit accuracy to minimize roundoff error. N

4. [0/2.5 Points]

DETAILS

PREVIOUS ANSWERS

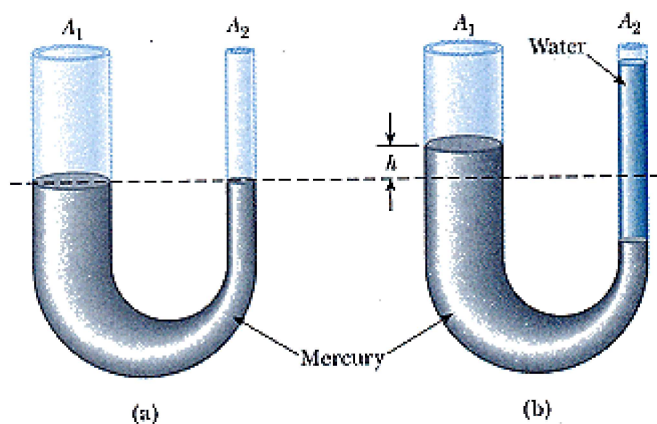
SERPSE7 14.P.016.

MY NOTES

ASK YOUR TEACHER

PRACTICE ANOTHER

Mercury is poured into a U-tube as in Figure (a). The left arm of the tube has a cross-sectional area A_1 of 94.0 cm^2 , and the right arm has a cross-sectional area A_2 of 5.30 cm^2 . Two hundred grams of water are then poured into the right arm, as in Figure (b).



(a) Determine the length of the water column in the right arm of the U-tube.

 ✗ cm

(b) Given that the density of mercury is 13.6 g/cm^3 , what distance h does the mercury rise in the left arm?

 ✗ cm

5. [0/2.5 Points]

DETAILS

PREVIOUS ANSWERS

SERPSE7 14.P.008.

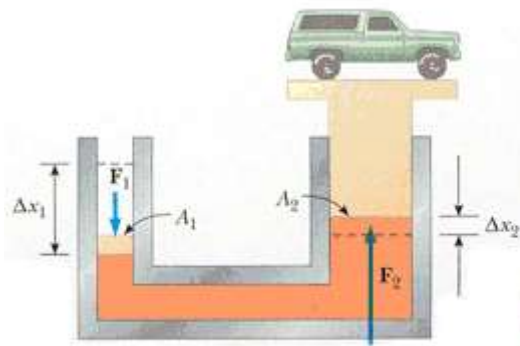
MY NOTES

ASK YOUR TEACHER

PRACTICE ANOTHER

The small piston of a hydraulic lift has a cross-sectional area of 2.70 cm^2 , and its large piston has a cross-sectional area of 202 cm^2 . What force must be applied to the small piston for the lift to raise a load of 14.4 kN ? (In service stations, this force is usually exerted by compressed air.)

\times N



6. [0/2.5 Points]

DETAILS

PREVIOUS ANSWERS

SERPSE7 14.XP.003.

MY NOTES

ASK YOUR TEACHER

PRACTICE ANOTHER

A U-tube of uniform cross-sectional area, open to the atmosphere, is partially filled with mercury. Water is then poured into both arms. If the equilibrium configuration of the tube is as shown in Figure P14.20, with $h_2 = 0.74$ cm, determine the value of h_1 .

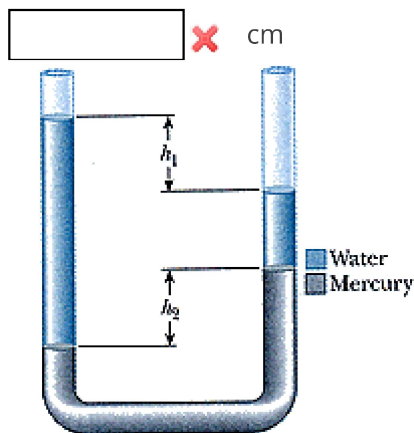


Figure P14.20

7. [0/2.5 Points]

DETAILS

PREVIOUS ANSWERS

SERPSE7 14.P.051.

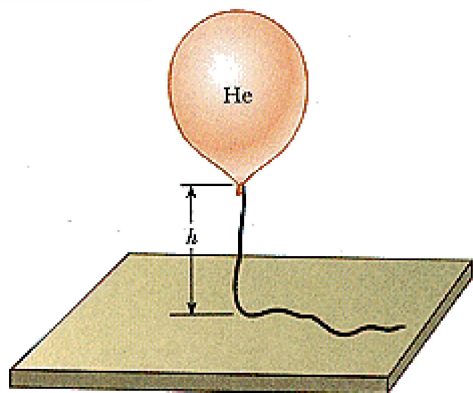
MY NOTES

ASK YOUR TEACHER

PRACTICE ANOTHER

A helium-filled balloon is tied to a 2.60 m long, 0.0516 kg uniform string. The balloon is spherical with a radius of 0.401 m. When released, it lifts a length h of string and then remains in equilibrium. Determine the value of h . The envelope of the balloon has mass 0.280 kg.

✗ m



8. [0/2.5 Points]

DETAILS

PREVIOUS ANSWERS

SERPSE7 14.P.061.

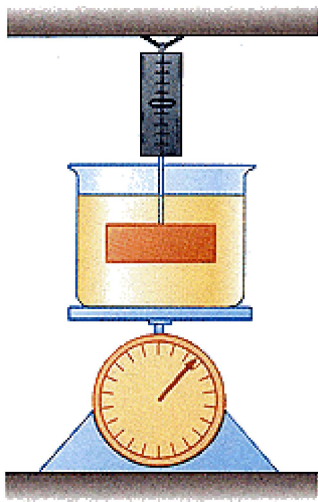
MY NOTES

ASK YOUR TEACHER

PRACTICE ANOTHER

A 0.99 kg beaker containing 2.05 kg of oil (density = 916.0 kg/m^3) rests on a scale. A 2.02 kg block of iron is suspended from a spring scale and completely submerged in the oil. Determine the equilibrium readings of both scales.

<input type="text"/>	✖ N (spring scale)
<input type="text"/>	✖ N (bottom scale)



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