**13. Fluid Mechanics homework problems (Physical Science)**

Name and date submitted (3 pts):

Instructions: Using this form as a template, create space in the document below and write or type your answers. Turn in your completed work as an email attachment.

 (15 questions, 100 points possible).

1. T/F: Pressure: Fluid particles are always moving, bumping the container and causing pressure.
2. T/F: Pascal’s Law states, “If you change the pressure in a confined fluid, that change is felt equally throughout all the fluid.”
3. T/F: 1 Pascal is equal to 1 Newton of force over a square meter (N/m2)
4. T/F: Archimedes’ Principle states, “A submerged or partially-submerged object is buoyed up by a force equal to the weight of the fluid it is displacing.”
5. When you go deeper in the water, the pressure increases because
	1. There is more salt in the water
	2. There is more water on top of you
	3. The water temperature gets colder
	4. There are living organisms in the water
6. In a certain hydraulic machine, the input piston has an area of 2 cm2 and the output piston has an area of 32 cm2. The output force will be \_\_\_\_\_\_\_\_\_\_\_\_ the input force.
	1. 16 times
	2. 1/16 of
	3. 32 times
	4. 1/32 of
7. The pascal is a unit of
8. Pressure
9. Force
10. Mass
11. Volume
12. Pressure is
13. Force
14. Volume x force
15. Force / area
16. Force / volume
17. Suitable units of pressure are
18. Feet-pounds
19. Pounds per square inch
20. Newtons per square meter
21. All of the above
22. A & B only
23. B & C only
24. Suitable units for the flowrate of a fluid are
25. Gallons per minute
26. m3 per second
27. ft3/sec
28. all of the above
29. Bernoulli’s Principle states
30. A fluid’s pressure increases as its speed increases
31. A fluid’s pressure decreases as its speed increases
32. A fluid’s volume increases as its pressure increases
33. A fluid’s volume increases as its force increases
34. When you compare the air pressure above the wing of a moving airplane to the air pressure below the wing,
35. There will be less pressure above the wing
36. There will be less pressure below the wing
37. There will be equal pressure above and below the wing
38. Not enough information to tell
39. Steel ships float because within their hulls are large volumes of
40. Water
41. Ballast
42. Air
43. Insulation
44. In the figure, the man (who weighs 686 N) and elephant (which weighs 11,760 N) are at equilibrium (perfectly balanced). What is the diameter in meters of the platform the man is standing on?
45. The small piston “A1” has a surface area of 2 in2, and the large piston “A2” has a surface area of 100 in2.



* 1. If you want to lift 1,000 lbs with piston A2, how much force do you need to apply to piston A1?
	2. Using the same information, how far does piston A1 need to travel in order to move piston A2 a distance of 1 inch?
	3. Using the same information, what is the ‘mechanical advantage’ of this hydraulic machine?