

PHYSICS 1B TEST THREE

1. SMALL TO LARGE

A huge lake (depth 39 m, density 1000 kg/cubic meter) is by a pipe of .51 square meters. what is the exit velocity? E a pipe of area 18 * .51 square meters is added to the end of original pipe what happens? Use the equation of continuity a sense!

- A. 6.23, B. 14.4, C. $\sqrt{2 \cdot 9.8 \cdot 39}$, D. 98, E. 1,390

2. KEPLER: RADIUS AND PERIOD

Derive Kepler's relation between the period of a planet distance from the sun.

3. ARCHIMEDES_DERIVE

Derive Archimedes Principle. Show it holds for any shape

4. BP-DERIVE

Derive Bernoulli's Equation from conservation of energy. the derivation of the energy stored in pressure.

5. PLANET TO MOON

You are located 890,000 meters in the y direction from a mass 1.2×10^{30} kg. An identical star is located $2 \times 890,000$ meters x direction from the first star. How much energy must you use your ship to a point centered between the stars? $G = 6.67 \times 10^{-11}$ your ship = 10,000 kg

- A. 1.69×10^7 , B. 2.51×10^7 , C. 2.97×10^7 , D. 3.94×10^7 , E. $(4.97 \times 10^7) \cdot 10,000 \cdot 1.2 \times 10^{30} \cdot 6.67 \times 10^{-11} \cdot (1 - 1/\sqrt{5}) / 890,000$

6. HOUSES

A 100 m/s wind is blowing over the roof of your house. the force(n) on the roof? Area = 250 square meters, Density of air = 1.2 kg/cub m

- A. 597,000, B. 1.12×10^6 , C. $(1.5 \times 10^6) \cdot 1.2 \cdot 100 \cdot 100 \cdot 250 / 2$, D. 2.73×10^6 , E. 5.85×10^6

7. ARCHIMEDES EXPLORER

You are exploring an ocean composed of strange heavy org

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fluids. Normally any object under a fluid is unstable and either floats or sinks. If there is a thermocline (say warm low density, = cubed, fluid over cold high density, = 5,900 kg/m cubed, fluid possible to make an object stay at a constant depth if it has (3,100 kg/m cubed) in between the two fluids. Your exploration is a vertical cylinder, weighted to stay upright, of height &

much is above the thermocline?

$8.1 \times (3,100 - 5,900) / (1,300 - 5,900)$
A. (4.93), B. 5.69, C. 10.2, D. 16.4, E. 19.7

8. GRAVITY SHELL

Prove that from the outside of a symmetrical spherical shell gravitational attraction is the same as it would be if all the mass of the shell was located at the center of the shell.

Shall I go on? [YES]

Shall I print the tests on the:

Terminal (T), Line printer (L), Both (B), or Neither (N)? T

Shall I print the key on the:

Terminal (T), Line printer (L), Both (B), or Neither (N)? T

Touch RETURN to continue.

ANSWER ! ! * ! * ! * ! ! ! ! * ! COPY 1
QUESTION ! 1 ! 2 ! 3 ! 4 ! 5 ! 6 ! 7 ! 8 !

PHYSICS 1B TEST THREE

1. SMALL TO LARGE

A huge lake (depth 40 m, density 1000 kg/cubic meter) is drained by a pipe of 1.1 square meters. What is the exit velocity? If a pipe of area 21×1.1 square meters is added to the end of the original pipe what happens? Use the equation of continuity a sense!

A. 8.69, B. 28, C. 122, D. 1,510, E. 1,780

2. KEPLER: RADIUS AND PERIOD

Derive Kepler's relation between the period of a planet and its distance from the sun.

3. ARCHIMEDES_DERIVE

Derive Archimedes Principle. Show it holds for any shape.

4. BP-DERIVE

Derive Bernoulli's Equation from conservation of energy. Show the derivation of the energy stored in pressure.

5. PLANET TO MOON

You are located 990,000 meters in the y direction from a star of mass 9.2×10^{19} kg. An identical star is located $2 \times 990,000$ meters in the x direction from the first star. How much energy must you use to move your ship to a point centered between the stars? $G = 6.67 \times 10^{-11}$ N m²/kg²
your ship = 13,000 kg

A. 1.49×10^7 , B. 1.82×10^7 , C. 2.63×10^7 , D. 3.37×10^7 , E. 4.46×10^7

6. HOUSES

A 79 m/s wind is blowing over the roof of your house. What is the pressure difference between the inside and outside of the house?