

Question 1

(1 points)

The water behind a dam pushes outward on it, and will topple it if it is not constructed correctly. Which of these dams experiences the largest outward force?

Image size: [s](#) [m](#) [L](#) [Max](#)



24.5% The forces on dam A are larger.

5.7% The forces on dam B are larger.

67.9% The forces on both dams are the same.




Your Answer

Question 2

(1 points)

A car has a tire (gauge) pressure of 45 psi measured at sea level. Suppose the car is driven up a mountain to 10,000 feet elevation. What will happen to the tire (gauge) pressure assuming the temperature stays the same?

5.7% It decreases.

88.7% It increases.  Your Answer

4.7% It stays the same.

Question 3

(1 points)

You dive in a swimming pool to a depth of 4.45 meters and do not equalize your ears (so that the pressure inside your ear canal remains at 1 atm). What is the force on your ear-drum if its area is 0.858 cm^2 ?

Please enter a numerical answer below. Accepted formats are numbers or "e" based scientific notation e.g. 0.23, -2, 1e6, 5.23e-8

3.75N  Your Answer

Your actual answer was 3.74 which differs from the answer above by a small rounding error or significant figures. Check with your instructor how this will be graded in a testing situation.

Question 4

(1 points)

What is the tallest straw you could use to sip water if your lungs can produce a gauge pressure of -54.2 torr?

Please enter a numerical answer below. Accepted formats are numbers or "e" based scientific notation e.g. 0.23, -2, 1e6, 5.23e-8

0.727 m  Your Answer

Your actual answer was 0.73 which differs from the answer above by a small rounding error or significant figures. Check with your instructor how this will be graded in a testing situation.

Question 5


(1 points)

Which of the following balloons has the largest buoyant force in air at atmospheric pressure?

0.0% A 1 liter balloon filled with air.

3.8% A 1 liter balloon filled with helium.

5.7% A 1 liter balloon filled with water.

89.6% All have the same buoyant force.  Your Answer

Question 6

(1 points)

If diving in freshwater you are experiencing an absolute pressure of 71.6 psi, what is the depth of your dive?

Please enter a numerical answer below. Accepted formats are numbers or "e" based scientific notation e.g. 0.23, -2, 1e6, 5.23e-8

132 feet  Your Answer

Your actual answer was 130 which differs from the answer above by a small rounding error or significant figures. Check with your instructor how this will be graded in a testing situation.

Question 7

(1 points)

A boat carrying a large boulder is floating on a lake. The boulder is thrown overboard and sinks. The water level in the lake with respect to the shore ...

2.8% rises.

64.2% drops.  Your Answer

32.1% remains the same.

Question 8

(1 points)

As blood flows from the aorta into a network of capillaries the effective area increases. How does the flow rate change from aorta to the capillaries.

- 83.0% It stays the same. Your Answer
- 10.4% It decreases.
- 4.7% It increases.

Question 9

(1 points)

A stream of water escapes through a small hole from a barrel filled with water. If you double the area of the hole the velocity of the stream will

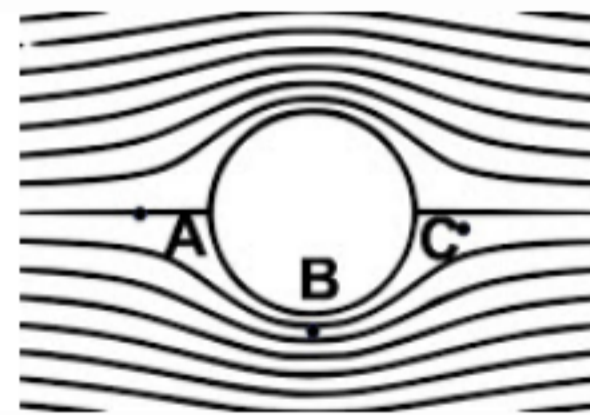
- 4.7% double.
- 0.9% increase by a factor 4.
- 92.5% stay the same. Your Answer

Question 10

(1 points)

The figure below shows the stream-lines of a flow around a spherical obstacle. At which of the three points is the flow velocity the highest?

Image size: [s](#) [M](#) [L](#) [Max](#)



- 0.9% A
- 94.3% B Your Answer
- 3.8% C

Question 11

(1 points)

Consider an open, fluid-filled barrel with a small hole at the bottom. Which of the following will increase the velocity of water as it streams out of the hole?

- 2.8% Making the hole bigger.
- 9.4% Placing the barrel higher up on a shelf.
- 80.2% Adding several large boulders to the barrel without blocking the hole. ✓ Your Answer
- 6.6% Increasing the fluid density.

Question 12

(1 points)

Consider a recirculating water chiller with a water pump and tube leading from the output of the pump back to the pump inlet. If you use a different tube with the same length but a diameter one third of the original diameter and you keep the pressure difference produced by the pump the same, the flow rate will ...

- 0.0% decrease by a factor of 2
- 0.0% decrease by a factor of 4
- 29.2% decrease by a factor of 9
- 69.8% decrease by a factor of 81 ✓ Your Answer

Question 13

(1 points)

If the frequency of a harmonic oscillator doubles (without changing the amplitude), by what factor does the maximum value of acceleration change?

- 0.0% $2/\pi$
- 0.0% $\sqrt{2}$
- 0.9% 2
- 97.2% 4 ✓ Your Answer

Question 14

(1 points)

A simple harmonic oscillator is described by the following equation:

$$x = 0.35 \text{ m} \cdot \cos(2.5 \text{ s}^{-1}t).$$

What is the maximum velocity?

0.9% 0.350 m/s

98.1% 0.875 m/s Your Answer

0% 1.25 m/s

0% 2.50 m/s

Question 15

(1 points)

At which point does a child on an oscillating swing experience the largest acceleration?

2.8% At the equilibrium.

95.3% At the highest point. Your Answer

0.9% Somewhere in between the two.

Question 16

(1 points)

What must be the minimum volume of a helium balloon for it to be neutrally buoyant in air. The density of air is 1.29 kg/m^3 , the density of helium is 0.17 kg/m^3 . The total mass of the helium balloon is the helium it holds as well as a 2.31 g rubber skin. You may ignore the tiny volume of the rubber skin.

Please enter a numerical answer below. Accepted formats are numbers or "e" based scientific notation e.g. 0.23, -2, 1e6, 5.23e-8

2.06 liters Your Answer

Your actual answer was 2.0625 which differs from the answer above by a small rounding error or significant figures. Check with your instructor how this will be graded in a testing situation.