

## G9 Physics Chapter 10 - Revision Problems

### Multiple Choice Questions.

<b>Q1.</b>	Determine the amount of force exerted by the atmosphere on the roof of a house (area = 95 m <sup>2</sup> ) if the pressure is 101,000 Pa.
<b>a.</b>	9.6 x 10 <sup>6</sup> N
<b>b.</b>	6.9 x 10 <sup>6</sup> N
<b>c.</b>	9.3 x 10 <sup>6</sup> N
<b>d.</b>	3.6 x 10 <sup>6</sup> N

<b>Q2.</b>	The atmospheric pressure at the top of a mountains is _____ the atmospheric pressure at sea level.
<b>a.</b>	Greater than
<b>b.</b>	Less than
<b>c.</b>	Equal to
<b>d.</b>	Inversely proportional

<b>Q3.</b>	With respect to hydraulic lifts, which of the following statements is true?
<b>a.</b>	Obey the law of conservation of energy
<b>b.</b>	Produce more output energy than input energy
<b>c.</b>	Produce more output work than input work
<b>d.</b>	Do not provide a mechanical advantage

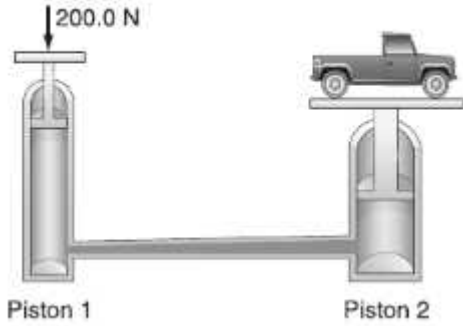
<b>Q4.</b>	Bernoulli's principle states that as air moves faster the pressure _____.
<b>a.</b>	Increases
<b>b.</b>	Decreases
<b>c.</b>	Does not change
<b>d.</b>	Depends on the humidity

<b>Q5.</b>	Which of the following statements about fluids is <b><i>not</i></b> correct?
<b>a.</b>	A fluid flows.
<b>b.</b>	A fluid changes its shape easily.
<b>c.</b>	Molecules of a fluid are free to move past each other.
<b>d.</b>	A fluid has a definite shape.

<b>Q6.</b>	A bed is 1.5 m in width, 2.5 m in length, and weights 1055 N. Assuming that the entire lower surface of the bed is contact with the floor, calculate the pressure that the bed exerts on the floor.
<b>a.</b>	250 Pa
<b>b.</b>	260 Pa
<b>c.</b>	270 Pa
<b>d.</b>	280 Pa

<b>Q7.</b>	When a gas is poured out of one container into another container, which of the following does <b><i>not</i></b> occur?
<b>a.</b>	The gas flows into the new container.
<b>b.</b>	The gas changes shape to fit the new container
<b>c.</b>	The gas keeps its original volume.
<b>d.</b>	The gas spreads out to fill the new container.

<b>Q8.</b>	If an object weighing 50.0 N displaces a volume of water with a weight of 10.0 N, what is the buoyant force on the object?
<b>a.</b>	10 N
<b>b.</b>	50 N
<b>c.</b>	60 N
<b>d.</b>	300 N

<b>Q9.</b>	 <p>If the second piston in the above diagram exerts a force of 41,000 N, what is the area of the second piston when the area of the first piston is <math>0.05\text{m}^2</math>?</p>
<b>a.</b>	$5.15\text{ m}^2$
<b>b.</b>	$7.75\text{ m}^2$
<b>c.</b>	$10.25\text{ m}^2$
<b>d.</b>	$410.0\text{ m}^2$

<b>Q10.</b>	Which one of the following items does not contain matter in the plasma state?
<b>a.</b>	Neon
<b>b.</b>	Lighting
<b>c.</b>	Stars
<b>d.</b>	Incandescent lighting

<b>Q11.</b>	A force, $F_1$ , of 230 N is applied on a hydraulic lift that raises a truck weighing 6500 N. If the force, $F_1$ , is applied on a $7.0\text{ m}^2$ piston, what is the area of the piston that raises the truck?
<b>a.</b>	$200\text{ m}^2$
<b>b.</b>	$0.0050\text{ m}^2$
<b>c.</b>	$0.25\text{ m}^2$
<b>d.</b>	$4.0\text{ m}^2$

<b>Q12.</b>	An operator applies a force of 200.0 N to the first piston of a hydraulic lift, which has an area of 5.4 cm <sup>2</sup> . What is the pressure applied to the hydraulic fluid?
<b>a.</b>	$3.7 \times 10^1$ Pa
<b>b.</b>	$3.7 \times 10^3$ Pa
<b>c.</b>	$2.0 \times 10^3$ Pa
<b>d.</b>	$3.7 \times 10^5$ Pa

<b>Q13.</b>	Which of the following statements is true according to Pascal's principle?
<b>a.</b>	Pressure in a fluid is greatest at the walls of the container holding the fluid
<b>b.</b>	Pressure in a fluid is greatest at the center of the fluid.
<b>c.</b>	Pressure in a fluid is the same throughout the fluid.
<b>d.</b>	Pressure in a fluid is greatest at the top of the fluid.

<b>Q14.</b>	<p>"A buoyant force acts in the opposite direction of gravity."</p> <p>Which of the following is true of an object completely submerged in water?</p>
<b>a.</b>	The net force on the object is smaller than the weight of the object
<b>b.</b>	The net force on the object is larger than the weight of the object.
<b>c.</b>	The net force on the object is equal to the weight of the object
<b>d.</b>	The object appears to weigh more than it does in air.

<b>Q15.</b>	A wooden cube of length 10.0 cm and with a density of 0.780 g/cm <sup>3</sup> is placed in a liquid. The resultant net force is 0 N. Determine the buoyant force acting on the cube.
<b>a.</b>	$7.65 \times 10^3$ N
<b>b.</b>	7.65 N
<b>c.</b>	6.40 N
<b>d.</b>	5.00 N

**Constructed Response Questions.**

<b>Q1</b>	<p>A hydraulic lift has a large piston with an area of <math>2.5 \text{ m}^2</math> and a small piston with area of <math>1 \text{ m}^2</math>. (<math>g = 10.0 \text{ m/s}^2</math>)</p>
<b>a.</b>	<p>What force must be applied by the large piston to lift a 1500 kg vehicle upward at a constant speed?</p>
<b>b.</b>	<p>What force must be applied to the small piston to lift a 1500 kg vehicle upward at a constant speed?</p>

**Q2**

A piece of wood with a mass of 6.88 kg is placed in fresh water ( $\rho_w = 1.00 \text{ g/cm}^3$ ,  $g = 9.81 \text{ m/s}^2$ ).

What is the density of the wood if it has an apparent weight of 6.13 N?

**Q3**

A hydraulic lift consists of two pistons that connect to each other by an incompressible fluid. If one piston has an area of  $0.15 \text{ m}^2$  and the other an area of  $6.0 \text{ m}^2$ , how large a mass can be raised by a force of  $130 \text{ N}$  exerted on the smaller piston?