Central Administration for Curriculum Development

Science development office

Physics

Second Secondary Grade

2026

Home Work

Week 9

Name: .....

Class: .....

School: .....

إعـداد

عبد الله مصطفي - حسن أشرف

مراجعة

محمد عنتر - مجدي فتحي
عمرو مالي

مكتب مستشار العلوم

عبدالله مصطفى - سعيد محمد

إشراف

د/ عزيزة رجب خليفة
مستشار العلـــوم

إشراف عام

د/ هالـــة عبـــد السلام
رئيس الإدارة المركزية للتعليم العام

Chapter 4| Pressure

First: Multiple Choice Questions

1) If you know that the unit of force is the newton and it is equal to kg. m/s^2. Which of the following units is used to measure pressure?

(A) $kg \cdot m^{-2} \cdot s^{-1}$

(B) $kg \cdot m^{-2} \cdot s^{-2}$

(C) $kg \cdot m^{-1} \cdot s^{-2}$

(D) $kg \cdot m^{-1} \cdot s^{-1}$

2) A tangential force of 200 N affected the upper surface of a cube with a side length of 10 cm. The resulting pressure is equal to ….

(A) $2 \times 10^4\ N/m^2$

(B) $2 \times 10^5\ N/m^2$

(C) $2 \times 10^3\ N/m^2$

(D) Zero

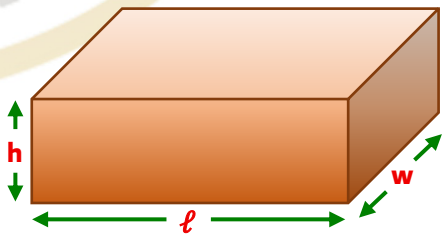
3) A cuboid with dimensions (ℓ, w, h) is placed on a horizontal surface as shown in the figure. The maximum pressure exerted on the surface can be calculated from the relationship

(A) $P_{max} = F_g/(w.h)$

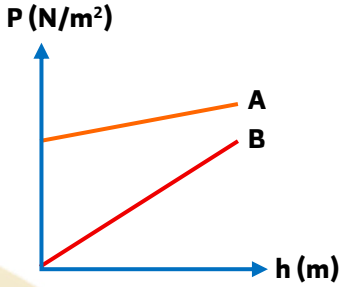
(B) $P_{max} = \rho.w.g$

(C) $P_{max} = F_g/(L.w)$

(D) $P_{max} = \rho.h.g$



4) The graph represents the relationship between the pressure at a point in the two different fluids A, B and the depth of this point in the fluids. Which of the following choices is correct?



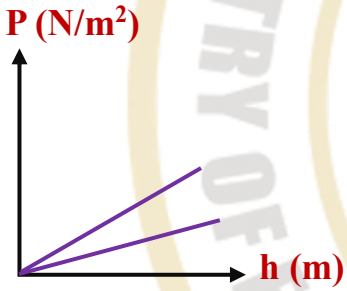
(A) $\rho_{(A)} > \rho_{(B)}$, A is exposed to air .

(B) $\rho_{(A)} > \rho_{(B)}$, A is not exposed to air

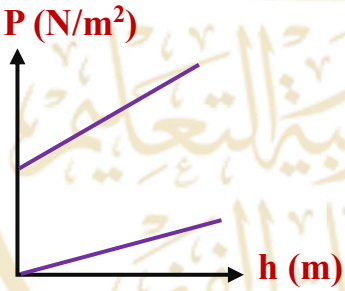
(C) $\rho_{(A)} < \rho_{(B)}$, A is exposed to air

(D) $\rho_{(A)} < \rho_{(B)}$, A is not exposed to air

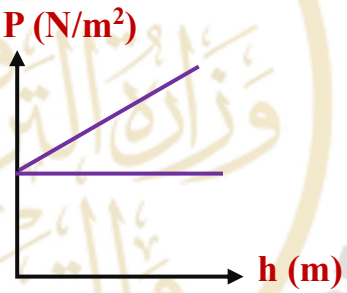
5) Two identical tanks containing two liquids. The density of the liquid in the second tank is greater than the density of the liquid in the first tank. The first tank is closed and the second tank is open. The graph shows the pressure (P) and the depth (h). The ...



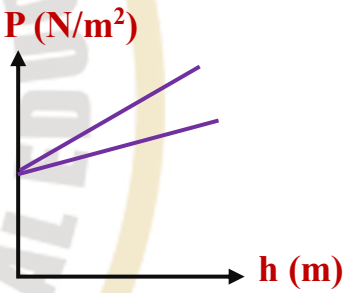
(D)



(C)

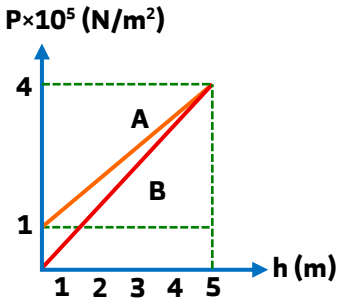


(B)



(A)

6) In the given graph: A and B are two different liquids. The ratio between density of liquid B and density of liquid A is:



(A) 5/4

(B) 4/5

(C) 4/3

(D) 3/4

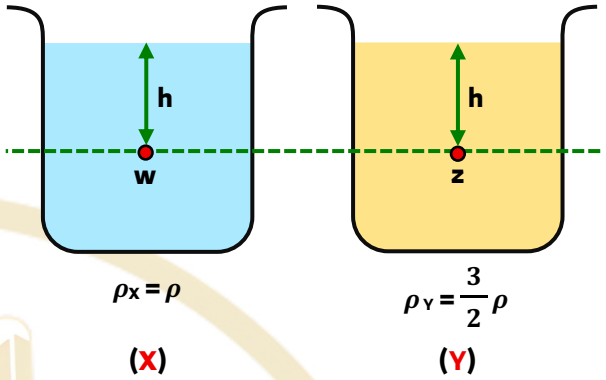
7) Two identical tanks containing two liquids (X, Y) of different densities, the relationship between the pressure at (w) and the pressure at (z) on the same horizontal level is ……..

(A) $P_w = P_z$

(B) $3P_w = 2P_z$

(C) $2P_w = 3P_z$

(D) $P_w = 1/2\ P_z$



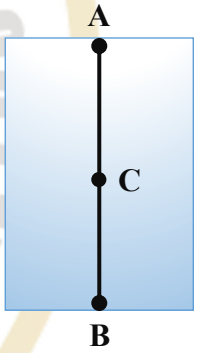
8) The figure represents a part of the fluid pressure at point A located at the surface is R where R represents the atmospheric pressure and the pressure difference between A, B is equal to 3R, and point C is located in the middle of the vertical distance between A, B. The value of the pressure at point C is equal to. .....

(A) (5 R)/2

(B) (3 R)/2

(C) 3 R

(D) 2 R



9) In the figure shown, three vessels are filled with water.

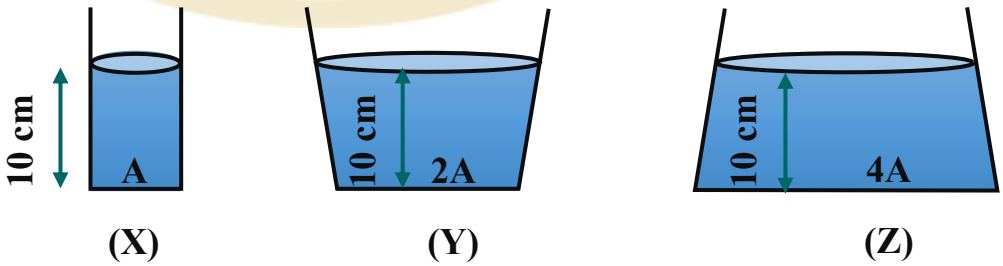
The ratio of the force of the water on the base is, in the order F_X: F_Y: F_Z, which is

(A) 10: 20: 15

(B) 4: 2: 1

(C) 1: 2: 2

(D) 1: 2: 4



10) Two identical tanks, each with a cross-sectional area of A, fill the first with water and the volume of water is 0.6 of the volume of the tank, and fill the second with oil and the volume of oil is 0.7 of the volume of the tank. The ratio between (water pressure at point X)/ (oil pressure at point Y) is:

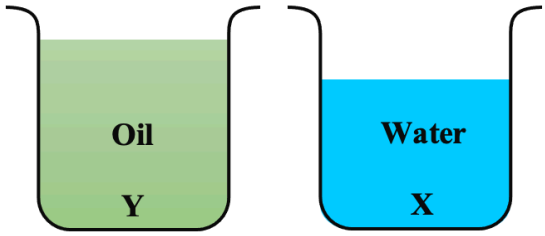
(Knowing that the ρ_w = 1000 Kg/m^3 and ρ_{oil} = 800 Kg/m^3)

(A) 4/5

(B) 2/25

(C) 5/4

(D) 15/14



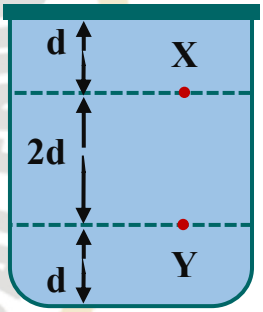
11) In the given figure, a tank is filled with a certain liquid. If the pressure of the liquid at point (X) is 3 bar, then the pressure at point (Y) is .....

(A) 9 bar

(B) 4.5 bar

(C) 6 bar

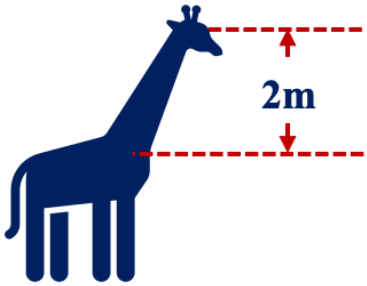
(D) 12 bar



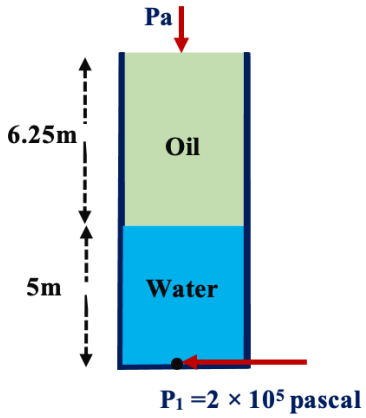
Second: Essay Questions

12) What is the pressure difference between the heart and the brain in a giraffe, if the brain is 2m above the heart?

(Blood density 1060 kg/m^3, assuming constant blood velocity



13) From the opposite figure, Calculate the pressure on the surface of the oil Knowing that ρ_{Oil} = 800 Kg/m^3, g = 10 m/s^2, ρ_W = 1000 Kg/m^3.



14) A tank with dimensions 200 cm × 100 cm × 50 cm is filled with water up to a height of 2 m. Calculate:

(a) The pressure of the water on the bottom of the tank.

(b) The force exerted by the water on the bottom of the tank.

(c) The pressure of the water at a point 40 cm above the bottom.

-The end-

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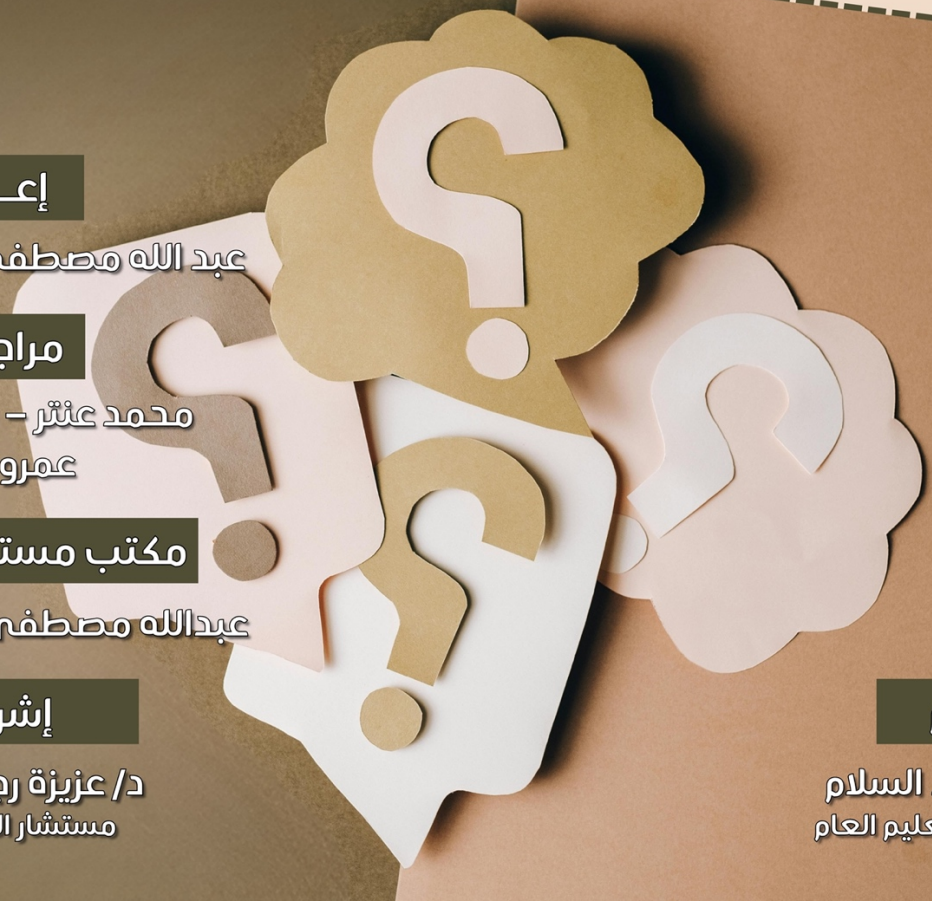

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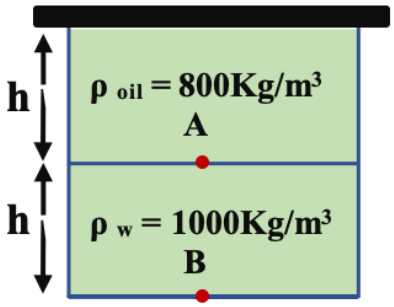
Chapter 4| Pressure

Group (A)

First: Multiple Choice Questions

1) A vessel contains a quantity of water and oil. The ratio between Pressure at point A and Pressure at point B is …….



(A) 4/6

(B) 4/8

(C) 9/10

(D) 4/9

2) A wooden table has a top surface with dimensions 1.6 m × 2 m.
Calculate the force exerted by atmospheric pressure on the table's surface.
(Knowing that $P_a = 1.03 \times 10^5$ N/m²)

(A) 1.013×10^5 N

(B) 3.24×10^5 N

(C) 0.317×10^5 N

(D) 3.24×10^5 N

3) A set of containers is filled with water as shown in the figure.

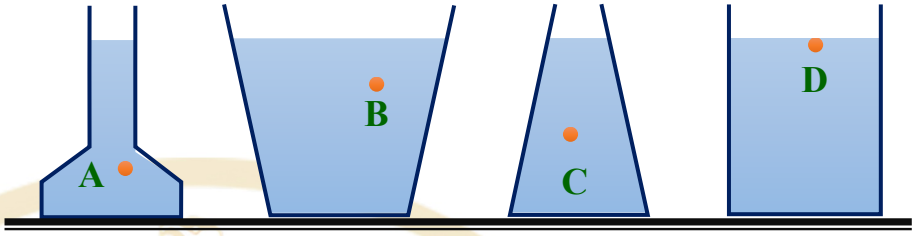
Which of the following represents the correct order of pressure at points A, B, C, and D?

(A) $P_A > P_B > P_C > P_D$

(B) $P_D > P_C > P_B > P_A$

(C) $P_A > P_C > P_B > P_D$

(D) $P_D > P_B > P_C > P_A$



4) A person is diving in a liquid with a density of 1030 kg/m³.

The maximum pressure that can be tolerated without eardrum rupture is 30.6×10^4 N/m².

Given that atmospheric pressure (Pa) = 1.013×10^5 N/m² and g = 9.8 m/s²,

the maximum depth the diver can reach is:

(A) 10.11 m

(B) 30.32 m

(C) 20.28 m

(D) 40.35 m

Second: Essay Questions

5) A solid cube and a solid rectangular block are made of the same material. The dimensions of the rectangular block are (10 cm × 20 cm × 30 cm). When the block is placed on a table resting on the face (20 cm × 30 cm), the pressure it exerts is three times the pressure exerted by the cube when placed on the same table. Calculate the side length of the cube.

Group (B)

First: Multiple Choice Questions

1) The figure shows the relationship between the pressure at several points within the liquid and their depths.

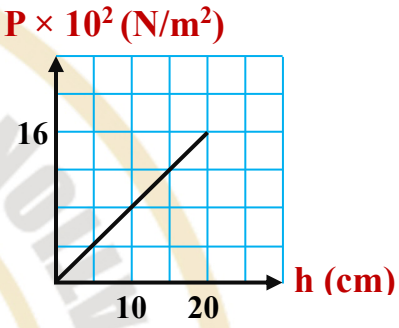
Given that the acceleration due to gravity is g = 10 m/s², the density of the liquid is:

(A) 800 kg/m³

(B) 0.8 kg/m³

(C) 8000 kg/m³

(D) 0.16 kg/m³



2) Two bodies (A, B) are placed at two different depths (15 cm, 20 cm) respectively in a closed container filled with water. The ratio between the pressure exerted on body B and the pressure exerted on body A is equal to ……

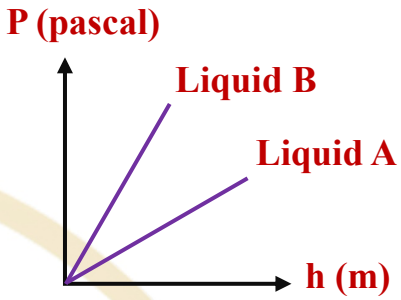
(A) 4/3

(B) 3/4

(C) 5/4

(D) 4/5

3) The graph shows the relationship between the pressure of two different liquids and the height of the liquid column (h) for two separate experiments. If the slope of straight-line A = 7900 and the slope of straight-line B = 9800. Which of the following choices is correct?



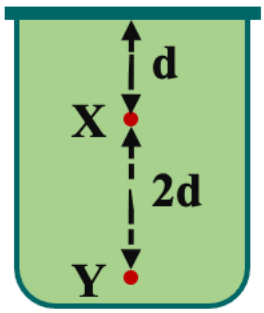
(A) $\rho_B > \rho_A$

(B) $\rho_A = 2\rho_B$

(C) $\rho_A = 9.8\ \rho_B$

(D) $\rho_B = \rho_A$

4) A container holds a liquid, The ratio of the pressure at point X to the pressure at point Y is:



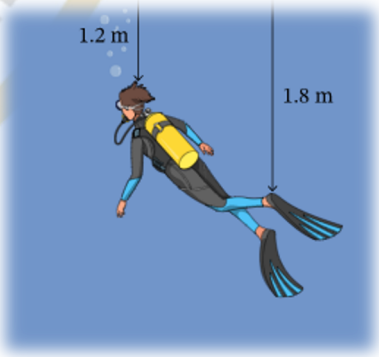
(A) 2/1

(B) 1/3

(C) 1/2

(D) 1/1

Second: Essay Questions



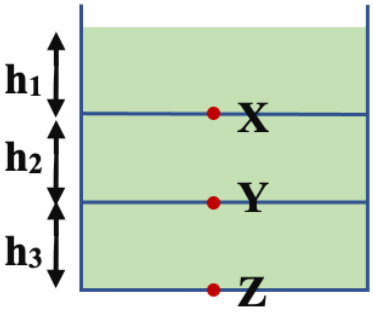
5) A diver swims in water with a density of 1015 kg/m³, as shown in the figure.

Calculate the difference in water pressure between the diver's head and feet.

Group (C)

1) The figure shows containers filled with a liquid of density ρ, under gravitational acceleration g, and liquid heights $h_1 = h_2 = h_3$.

The pressures at points X, Y, and Z are:



(A) Px > Py > Pz

(B) Px = 3 Pz = 2 Py

(C) Pz > Py > Px

(D) Py = 2 Pz = 3 Px

2) At a point inside a liquid, the pressure:

A) Acts only in the downward direction

B) Acts equally in all directions and increases with depth

C) Acts parallel to the surface of the liquid

D) Decreases with the depth of the liquid

3) A submarine is designed to withstand a maximum pressure of 12.2×10^5 N/m^2.

If the density of seawater is 1030 kg/m^3, what is the maximum depth it can safely dive to?

Also, if the diameter of its hatch is 100 cm, what is the force acting on the hatch at that depth? (Take g = 9.8 m/s^2)

(A) Depth = 121 m, Force = 3.8×10^6 N

(B) Depth = 121 km, Force = 9.6×10^5 N

(C) Depth = 121 m, Force = 9.6×10^5 N

(D) Depth = 121 km, Force = 3.8×10^6 N

4) A beaker contains mercury to a height of 5 cm, above which there is a layer of water 10 cm high, and on top of that, a layer of kerosene 2 cm high.
Given that the densities of mercury, water, and kerosene are 13600 kg/m^3, 1000 kg/m^3, and 800 kg/m^3 respectively, and the acceleration due to gravity is g = 9.8 m/s^2. The total pressure exerted by all the liquids on the bottom of the beaker is ……..

(A) 7.81×10^3 N/m^2

(B) 7.5×10^3 N/m^2

(C) 8×10^3 N/m^2

(D) 9.20×10^3 N/m^2

Second: Essay Questions

5) A rectangular block has dimensions 25 cm × 20 cm × 10 cm and a density of 2700 kg/m³. It is placed on a horizontal table as shown. Calculate:

(a) The pressure exerted by the block.

(b) The maximum pressure that the block can exert.

(c) How should the block be placed to produce the maximum pressure?