



The National
Orthodox School
Shmaisani

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Subject: Physics

Title: Pressure

Name:

Grade-Section: 9G (IB)

Solve the following questions taking into account $g=9.81 \text{ kg}\cdot\text{m}/\text{s}^2$

- 1) If your mass is 59 kg and the total area of the soles of your feet is 520 cm^2 , what pressure would you exert on the ground?

- 2) Find the pressure exerted on the ground by a three legged milking stool if the stool has a mass of 10 kg, the mass of the milker is 55 kg and the legs are circular each with a diameter of 5 cm.

- 3) A 63–kg man stands on the ground. If the man wears peculiar, box shaped shoes which measure $12 \text{ cm} \times 19 \text{ cm}$.
 - a) what pressure (in Pa) is exerted on the ground by the man?

 - b) If he stands on one foot what is the pressure?

- 4) Find the force exerted on the window of a car by the atmosphere, if the window has an area of $57 \text{ cm} \times 54 \text{ cm}$. Atmospheric pressure = 101325 Pa .
- 5) A 2130 kg car rests on 4 tires each inflated to 270 kPa . What surface area (in cm^2) does each tire have in contact with the ground? (assume the weight is evenly distributed on each wheel).
- 6) Find the pressure (in pascals) produced by a kilogram of nickel on a horizontal surface if the area it rests on is 160 cm^2 .
- 7) Find the pressure (in pascals) exerted on the floor by a 410 N box whose bottom area is $52 \text{ cm} \times 24 \text{ cm}$.
- 8) Find the pressure exerted on the ground (in pascals) by a 95 kg person who is sitting on a chair whose 4 legs touch the ground with an area of $2 \text{ cm} \times 2 \text{ cm}$ each.
- 9) Find the force exerted on a $3 \text{ m} \times 9 \text{ m}$ wall by the atmosphere, if atmospheric pressure is 101325 Pa .

- 10) A human hand has an area of 99 cm^2 . Determine the amount of force it experiences at one atmosphere of pressure (101325 Pa).
- 11) Calculate the pressure in a magma chamber at a depth of 2 km. Assume the density of magma is 2650 kg/m^3 and gravitational field strength is 9.8 N/kg . (Ignore atmospheric pressure)
- 12) A sample of gas at standard temperature and pressure (STP: 1atm or 101325 Pa & 0°C) has a volume of 350 cm^3 . Calculate the volume of the gas sample if pressure was increased to 182,000Pa.

13)

Calculate the absolute water pressure at the bottom of this swimming pool:
[density of water = 1000 kg/m^3 , atmospheric pressure is $1.01 \times 10^5 \text{ N/m}^2$.



a) at the shallow end of the pool.

b) At the deep end of the pool.