Understanding Pressure

Density

$$\rho = \frac{m}{V}$$

ρ = *density*	*(kg m^{-3})*
m = mass	*(kg)*
V = volume	*(m^3)*

Pressure

$$P = \frac{F}{A}$$

P = Pressure	*(Pa or N m^{-2})*
A = Area of the surface	*(m^2)*
F = Force acting normally to the surface	*(N or $kgms^{-2}$)*

Example 1

A force F is acting on a surface of area $20cm^2$, produces a pressure 2500Pa on the surface. Find the magnitude of the force.

[5N]

[Step by step answer]

Example 2

A block of wood 3 m long, 5 m wide and 1 m thick is placed on a table. If the density of the wood is 900 kgm^{-3}, find

a. the lowest pressure
b. the highest pressure

on the table due to the block.

[a. 9000 Pa; b. 45,000 Pa]

[Step by step answer]

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Example 3

Two cubes made of the same material; one has sides twice as the other, lying on a table. Standing on one face, the small cube exerts a pressure M on the table. What is the pressure (in term of M) exerted by the larger cube standing on one of its faces, on the table?

[2M]

[Step by step answer]