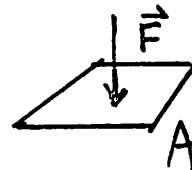


FLUIDS!

Density = mass per unit volume. Density characterizes specific substances.

Pressure... the exerted pressure at a point is the magnitude of the applied force per unit area. Pressure is a scalar.



Pressure in a fluid:

$$\frac{dp}{dy} = \rho g.$$

If the density is constant,

$$p(y) = p_0 + \rho g y.$$

Barometer: $\rho g h = p_a$.

Gauge pressure: $p_g = p - p_a$.

Pascal Principle: Any pressure exerted on a fluid is exerted at each point within the fluid.

$$p = F_1/A_1 = F_2/A_2.$$

Archimedes' Principle: The buoyant force exerted on an object in a fluid is precisely the supporting force that was originally exerted on the fluid the object has displaced: $B = \rho_f g V$.

Equation of Continuity: $A_1 v_1 = A_2 v_2$.

Bernoulli Principle:

$$p + (1/2)\rho v^2 + \rho g y \text{ is a constant.}$$

For a gas not otherwise disturbed, $pV = \text{constant}$.

