Hydrostatic Force (HW #4)

Water is (nearly) incompressible! A water balloon that is squeezed vertically pushes out horizontally and vice versa. Gas is compressible - we can compress a lot of it into a small oxygen tank.

The force water exerts on an object, or **hydrostatic force** on an object, is then the mass of the water laying over that object times standard gravity. Hydrostatic pressure is merely hydrostatic force / surface area of the object.

What is the hydrostatic force on a circular lamina (that is, it is assumed to be two dimensional) with radius of 2 meters that is 100 meters under the surface of water and lying parallel to the surface. Use 10 m/sec^2 for standard gravity and 1000 kg/m^3 for the density of water.

How does this answer change if the circular lamina is perpendicular to, and with its center 100 meters below, the surface of the water?

Find the hydrostatic force on a right triangular lamina with legs of 4 and 5 meters and with the 4 meter leg perpendicular to, and 3 meters below, the surface.

Why does air in oxygen tanks last less time at deeper levels?