73. (a) Using Eq. 15-10, we have $p_g = \rho g h = 1.21 \times 10^7$ Pa.

(b) By definition, $p = p_g + p_{\text{atm}} = 1.22 \times 10^7$ Pa.

(c) We interpret the question as asking for the total force *compressing* the sphere's surface, and we multiply the pressure by total area:

$$p\left(4\pi r^2\right) = 3.82 \times 10^5 \text{ N} .$$

(d) The (upward) buoyant force exerted on the sphere by the seawater is

$$F_b = \rho_w g V \qquad \text{where } V = \frac{4}{3}\pi r^3 \quad .$$

Therefore, $F_b = 5.26$ N.

(e) Newton's second law applied to the sphere (of mass $m = 7.0$ kg) yields

$$F_b - mg = ma$$

which results in $a = -9.04$, which means the acceleration vector has a magnitude of 9.04 m/s^2 and is directed downward.