2.9

2.9 Bathyscaphes are capable of submerging to great depths in the ocean. What is the pressure at a depth of 5 km, assuming that seawater has a constant specific weight of 10.1 kN/m^3? Express your answer in pascals and psi.

$$p = \gamma h + p_0$$

At the surface $p_0 = 0$ so that

$$p = (10.1 \times 10^3 \tfrac{N}{m^3})(5 \times 10^3 m) = 50.5 \times 10^6 \tfrac{N}{m^2} = \underline{\underline{50.5 \text{ MPa}}}$$

Also,

$$p = (50.5 \times 10^6 \tfrac{N}{m^2})(1.450 \times 10^{-4} \tfrac{\frac{lb}{in.^2}}{\frac{N}{m^2}}) = \underline{\underline{7320 \text{ psi}}}$$