1.77

1.77 A 1-m³ volume of water is contained in a rigid container. Estimate the change in the volume of the water when a piston applies a pressure of 35 MPa.

$$E_V = -\frac{dp}{d\forall/\forall} \qquad \text{(Eq. 1.12)}$$

Thus,

$$\Delta\forall \approx -\frac{\forall\,\Delta p}{E_V} = -\frac{(1\ m^3)\left(35\times10^6\ \frac{N}{m^2}\right)}{2.15\times10^9\ \frac{N}{m^2}} = -0.0163\ m^3$$

or

decrease in volume $\approx 0.0163\ m^3$