

# Mathematical Problems CH-07 part-02

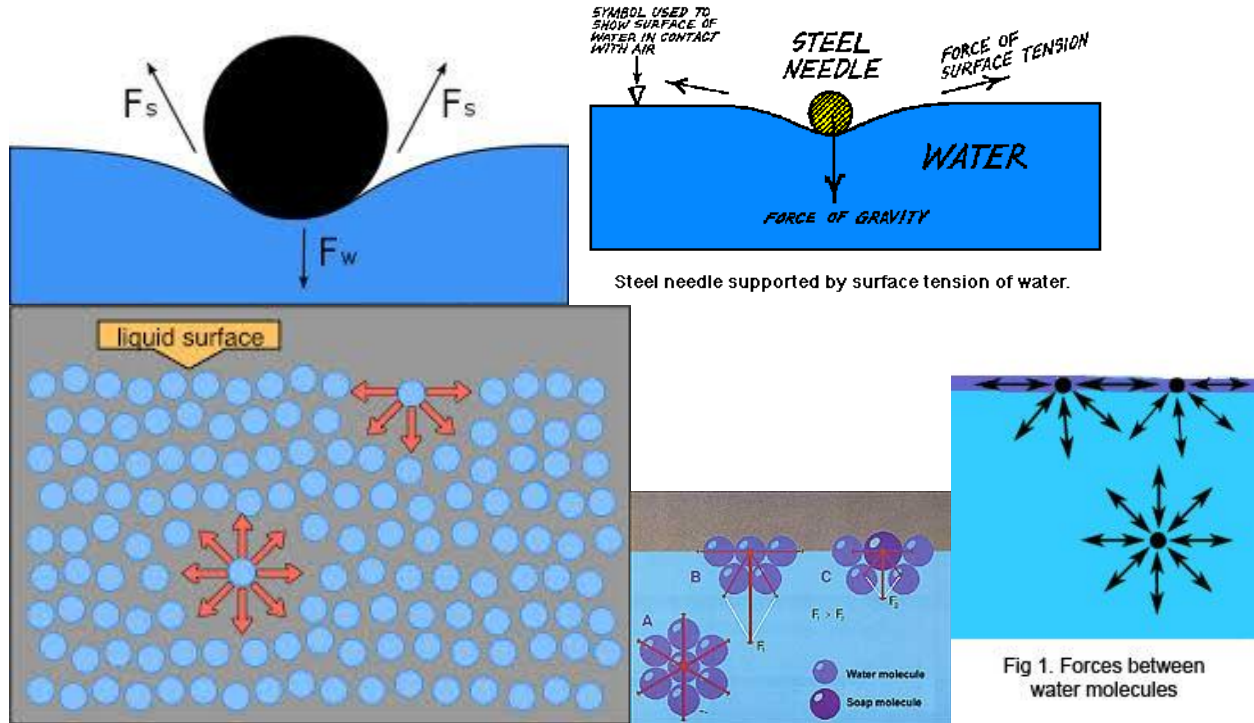


Fig 1. Forces between water molecules

Q. Calculate the force required to take away a horizontal wire of length 0.04 m from the surface of water. [Surface tension of water =  $72 \times 10^{-3} \text{ Nm}^{-1}$ ]

Q. Calculate the force required to take away a flat circular plate of radius 5cm from the surface of water. [Surface tension =  $72 \times 10^{-3} \text{ Nm}^{-1}$ ]

Q. Calculate the force required to take away a horizontal **wire** of length 0.08 m from the surface of water. [Surface tension of water =  $72 \times 10^{-3} \text{ Nm}^{-1}$ ][Ans.  $576 \times 10^{-5} \text{ N}$ ]

Q. Calculate the force required to take away a flat circular plate of radius 4 cm from the surface of water. [Surface tension of water =  $72 \times 10^{-3} \text{ Nm}^{-1}$ ] [Ans.  $1808 \times 10^{-5} \text{ N}$ ]

\*Q. The force required **to take away** a horizontal wire of length 4 cm from the surface of water is  $5.824 \times 10^{-3} \text{ N}$ . Calculate the **surface tension** of water. [Ans.  $72 \times 10^{-3} \text{ Nm}^{-1}$ ]

\*Q. The force required **to take away** a horizontal wire of length 0.05 m from the surface of water is  $7.28 \times 10^{-3}$  N. Calculate **the surface tension** of water.

\*Q. **A film of soap** formed on a rectangular frame of length 10 cm dipping into a soap solution. The frame hangs from the arm of a balance. An extra weight of 0.42 g placed was in the opposite pan to balance the pull of the frame. Calculate **surface tension** of the soap solution.

\*Q. **A film of soap** formed on a rectangular frame of length 8 cm dipping into a soap solution. The frame hangs from the arm of a balance. An extra weight of 0.5 g placed in the opposite pan to balance the pull of the frame. Calculate the **surface tension** of the soap solution.2

\*Q. In order **to raise a horizontal wire** of length 0.05m from the surface of water, a force of  $7.28 \times 10^{-3} \text{N}$  along with the weight of the wire is required. Determine the **surface tension** of the water.

\*Q. Calculate the **maximum force** that is needed to raise a needle of length of 4cm placed gently on the surface of water.[Surface tension of water is  $72 \times 10^{-3} \text{Nm}^{-1}$ ][ $5.76 \times 10^{-3} \text{N}$ ]