If the excess pressure inside a soap bubble is balanced by an oil column of 2 mm, then the surface tension of soap will be? (r = 1cm, density of oil = 0.8 g/cm³)

The excess pressure inside a soap bubble equals:

$$p = \frac{2\gamma}{r}$$

where γ - surface tension of soap, r – radius of the bubble

The pressure of an oil column equals:

$$p = \rho g h$$

where ρ - density of oil, g − acceleration due to gravity, h - high of column

Therefore:

$$\rho g h = \frac{2\gamma}{r}$$

or:

$$\gamma = \frac{1}{2}\rho g h r = 0.078 \frac{N}{m}$$

Answer: $0.078 \frac{N}{m}$