The excess pressure inside a spherical drop of water is four times that of another drop. Then their respective mass ratio is?

The excess pressure inside a spherical drop of water equals:

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

where γ – surface tension for water, r – radius of the drop

So, if we have 2 drops with excess pressures $4p_1 = p_2$ then:

$$4\frac{2\gamma}{r_1} = \frac{2\gamma}{r_2}$$

or:

$$\frac{r_1}{r_2} = 4$$

But on other hand, mass of spherical drop of water equals:

$$m = \frac{4}{3}\pi r^3 \rho$$

where ρ – density of water, r – radius of the drop

Therefore,

$$\frac{m_1}{m_2} = \frac{r_1^3}{r_2^3} = \left(\frac{r_1}{r_2}\right)^3 = 4^3 = 64$$

Answer: 64