Boyle's law

Boyle's law states that: "For a fixed mass of gas at constant temperature, the volume is inversely proportional to the pressure." This means that when you double the pressure, the volume will halve.

High pressure cylinders VS atmospheric cylinders

When in a hospital, there are an number of pros and cons when using high pressure cylinders to supply oxygen rather than in atmospheric cylinders.

Advantages:

- Less storage space will be needed for the high pressure cylinders than the atmospheric • cylinders, as there will be less of them, but more oxygen. By doing so, you could store more cylinders in an area. You could also save on purchasing more storage space, resulting in a bigger profit/income.
- Less transport is needed than the atmospheric cylinders, so that there will be lesser journeys to get the high pressure cylinders from place to place. This could also result in a decrease in the transportation fees, resulting in a bigger profit/income.
- The high pressure cylinders will last longer than the atmospheric cylinders and will not need as much maintenance to replace them; therefore there would be a decrease in maintenance fees, resulting in a bigger profit/income. This could potentially save lives, see low storage of cylinders could cause oxygen deficiency in some patient which be fatal.
- There may be more sales and distributions turns the efficiency of the high pressure • cylinder, resulting in a bigger profit (income 5 of 1 Froľ

Disadvantages

- High pressure cylinders are more costly to produce than atmospheric cylinders. This may result in a smaller profit/income due to the higher fee. This may also lead to a decrease in sales and distribution due to the higher price.
- Each high pressure cylinder will be heavier, which means maintenance could possibly cost more. This may result in a smaller profit/income due to the higher fee.
- If the cylinder would somehow explode, the high pressure cylinder will cause more damage • than the atmospheric cylinder. Due to the higher risks, there may be a decrease in sales and distribution due to the higher price. This may lead to a smaller profit/income.

(1 * 9) / 200 = 0.045 V2 = **0.045m**³

5) P1 = 1000kPa

P2 = ?

V1 = Constant

V2 = Constant

T1 = 5°C = 278K

T2 = 25°C = 298K

(P1V1) / T1 = (P2V2) / T2

(P1/T1) * T2 = P2

(1000 / 278) * 298 = 1071.9kPa

As the pressure is 1071.9kPa and therefore less than 1100kPa, the safety value does not then. 6) P1 = 2.5 Atmospheres P2 = ? V1 = Constant V2 = Constant V2 = Constant Page T1 = 20°C = 293K T2 = 30°C = 303K (P1 $\frac{1}{1}$) / T1 = (P2 $\frac{1}{2}$) / T2 (P1 / T1) * T2 = P2 (2.5 / 293) * 303 = 2.585 P2 = 2.585 Atmospheres 7) P1 = 100kPa P2 = 40kPa V1 = 6m³

V2 = ?