

Teacher Notes

Boyle's Law

Which Free-standing unit does this material support?

Intermediate Level – Using algebra, functions and graphs

Coursework Portfolio

Ideally data used in students' portfolios should be identified and collected by the students themselves. This assignment aims to give practice in the methods needed to produce evidence for sections a and b.

What students need to know

- How to plot graphs by hand and on graphic calculators or computers
- How to find the equation of the linear line of best fit
- The shapes of graphs of equations of the form $y = kx^2 + c$, $y = kx^3$ and $y = \frac{k}{x}$

Answers to Sample Assessment Question

- a
- B
 - When the volume is very small, the pressure is very high.
When the volume is very large, the pressure is very low.
 - 741 100 (to 4 sf)
 - 7.411 cm^3 (4 sf)
- b
- $-18\,000 \text{ Pascals cm}^{-3}$
 - $P = -18\,000V + 232\,520$
 - Very large volume would give a *negative* pressure
Would predict a pressure of 235 520 Pascals for *zero* volume.

Answers to Assignment

- Gradient approximately $-16\,000 \text{ Pascals per cm}^3$
gives reduction in pressure per unit increase in volume.
- $P = -16\,250V + 219\,700$ (to 4 sf) from graphic calculator
- Predicts unrealistic pressure for large and small volume.
- $P = \frac{k}{V}$
- 741 100 (4 sf)

