Samples **Boyle's Law SOLUTIONS**

1. Since PV=constant,

$$\begin{aligned} P_1V_1 &= P_2V_2, \quad \text{so} \\ P_2 &= \frac{P_1V_1}{V_2} \\ &= 686 \text{ mmHg} \times \frac{1168 \text{ mL}}{976 \text{ mL}} \\ &= 821 \text{ mmHg} \end{aligned}$$

or to convert to Pa:

$$\begin{aligned} P_2 &= \frac{821 \text{ mmHg}}{760 \text{ mmHg}} \times 101.325 \text{ kPa} \\ &= 109.50 \text{ kPa} \end{aligned}$$

2. Since PV=constant,

$$\begin{aligned} P_1V_1 &= P_2V_2, \quad \text{so} \\ P_2 &= \frac{P_1V_1}{V_2} \\ &= 109.98 \text{ kPa} \times \frac{859 \text{ mL}}{133 \text{ mL}} \\ &= 710.30 \text{ kPa} \end{aligned}$$

or to convert to mmHg:

$$\begin{aligned} P_2 &= \frac{710.30 \text{ kPa}}{101.325\text{kPa}} \times 760 \text{ mmHg} \\ &= 5.33 \times 10^3 \text{ mmHg} \end{aligned}$$

3. Since PV=constant,

$$\begin{aligned} P_1V_1 &= P_2V_2, \quad \text{so} \\ P_2 &= \frac{P_1V_1}{V_2} \\ &= 691 \text{ mmHg} \times \frac{1000 \text{ mL}}{103 \text{ mL}} \\ &= 6.71 \times 10^3 \text{ mmHg} \end{aligned}$$

or to convert to Pa:

$$\begin{aligned} P_2 &= \frac{6.71 \times 10^3 \text{ mmHg}}{760 \text{ mmHg}} \times 101.325 \text{ kPa} \\ &= 895.05 \text{ kPa} \end{aligned}$$