1. Draw a qualitative graph to show how the first property varies with the second in each of the following:
   (a) $P$ versus $T$ with constant $V$ (label each axis)

   \[ T \]
   \[ P \]

   (b) $P$ versus $V$ with constant $T$ (label each axis)

   \[ V \]
   \[ P \]

2. A hydrogen ($H_2$) balloon has a volume of 3.2 L at $-120 \, ^\circ C$. What will be its volume at 50 $^\circ C$ assuming constant pressure?

   \[
   V_1 = 3.2 \text{ L} \\
   T_1 = -120 \, ^\circ C + 273 = 153 \, K \\
   V_2 = \, ? \\
   T_2 = 50 \, ^\circ C + 273 = 323 \, K
   \]

   \[
   \frac{V_1}{T_1} = \frac{V_2}{T_2} \\
   V_2 = \frac{V_1 T_2}{T_1} = \frac{(3.2 \text{ L})(323 \, K)}{153 \, K} = 6.8 \text{ L}
   \]