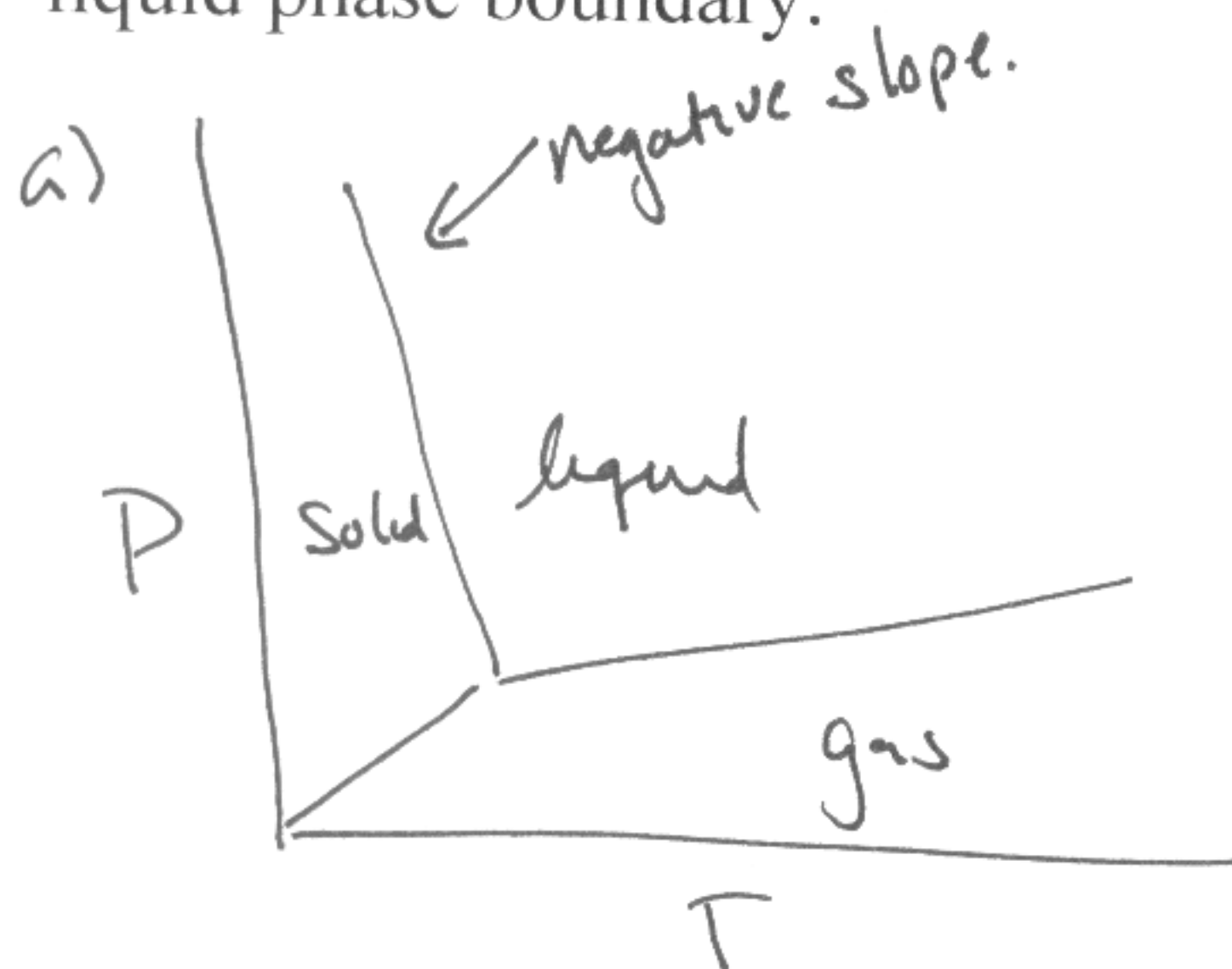


Quiz 3

Both  $\text{H}_2\text{O}$  and  $\text{I}_2$  have a solid-liquid phase boundary with a negative slope; i.e. as the pressure of the solid phase increases the melting temperature decreases.

a) Draw a generic phase diagram demonstrating this behavior.

b) Another physical property that  $\text{H}_2\text{O}$  and  $\text{I}_2$  have in common is that  $\rho(\text{liquid}) > \rho(\text{solid})$ . Use this information to propose a physical reason for the negative slope of the solid-liquid phase boundary.



b)  $\rho = \frac{\text{mass}}{\text{volume}}$

$\rho(l) > \rho(s)$  implies that a greater amount of material can be put in the same volume in the liquid phase than in the solid phase. As pressure increases, the material can give way by transforming to the liquid, higher density phase.