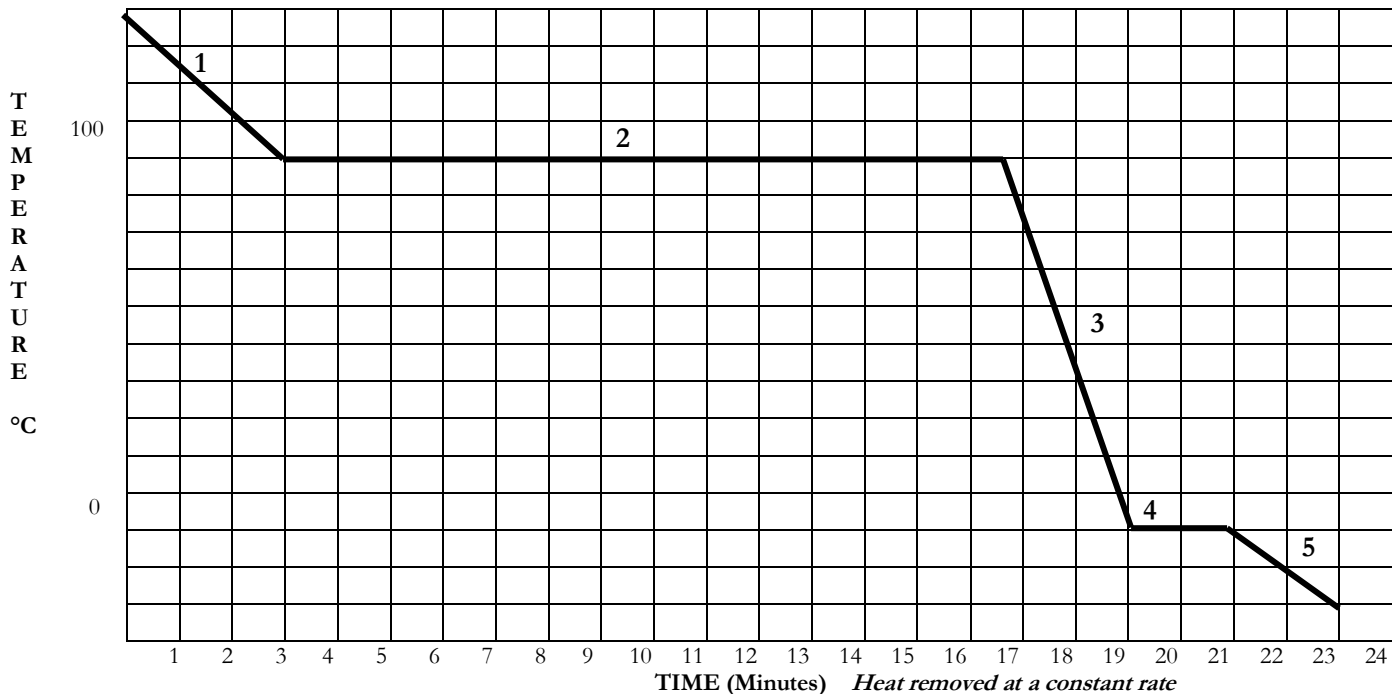


B. The following is a **cooling curve** showing the **release** of heat at a constant rate of 500.0 joules/minute from a 3.00 gram sample of water vapor at 140.0°C. The final temperature of the ice is -20.0°C.



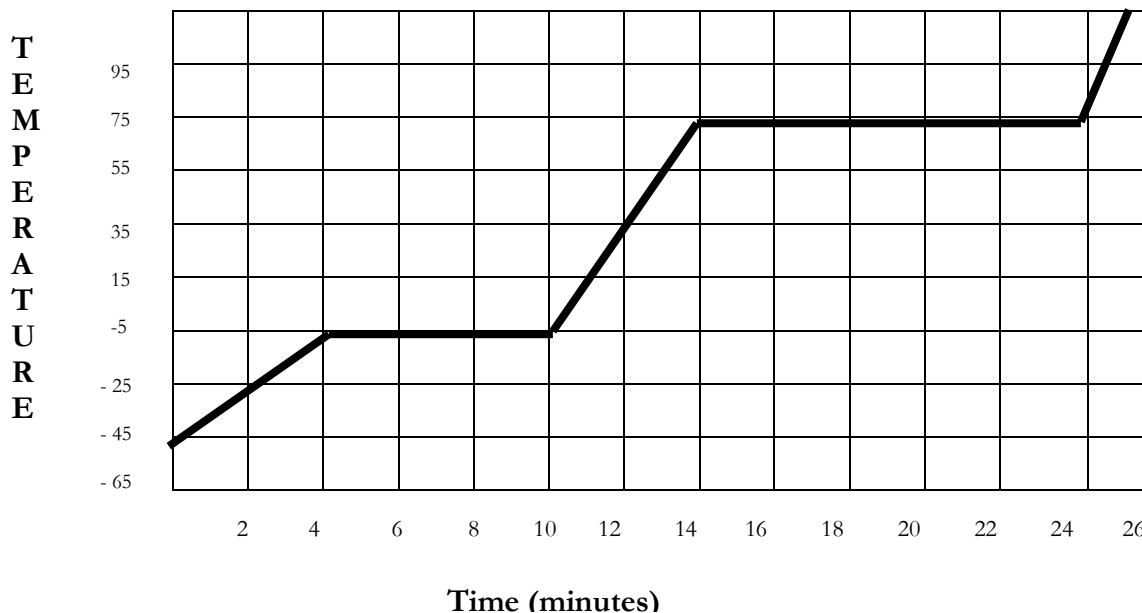
Questions

1. During which segments is kinetic energy decreasing? _____
2. During which segments does kinetic energy remain the same? _____
3. During which segments is potential energy decreasing? _____
4. During which segments does potential energy remain the same? _____
5. During which segments is one phase only present? _____
6. During which segments are two phases present? _____
7. At what time does the liquid phase first appear? _____
8. At what time does the solid phase first appear? _____
9. At what time do the particles have the highest average kinetic energy? _____
10. Phase changes that occur with a release of energy are _____.
11. _____ and _____ are exothermic phase changes.
12. During which segment could the heat of solidification be determined? _____
13. During which segment could the heat of condensation be determined? _____
14. How long does it take to completely freeze the sample at its freezing point? _____
15. How long does it take to completely condense the sample at its condensation point? _____
16. During which segment is the substance entirely in the solid state? _____
17. During which segment is the substance entirely in the liquid state? _____
18. During which segment is the substance entirely in the gas state? _____
19. During which segment is there an equilibrium between the solid and liquid states? _____
The temperature of the sample at this point is _____ Kelvin.
20. During which segment is there an equilibrium between the liquid and gas states? _____
The temperature of the sample at this point is _____ Kelvin.

Name _____

Date _____

- C. The following is a heating curve for substance X. 15.00 grams of substance X are heated at a constant rate of 500.0 joules/min.



For answers that require calculations, express using the correct number of significant figures and include units.

- The melting point is _____. The boiling point is _____.
- The time at which the liquid phase first appears is _____ minutes. The time at which the gas phase first appears is _____ minutes.
- The sample is completely in the liquid phase between _____ and _____ minutes.
- Determine the heat of fusion of this substance.
- Determine the heat of vaporization of this substance.
- Determine the specific heat of substance X (in the liquid state).
- Compare the intermolecular forces present in substance X to those present in a sample of water. *Explain completely.*
