Name_____

The Layers of the Atmosphere

The atmosphere can be divided into four layers based on temperature changes. The layer closest to Earth is the troposphere. Above this layer is the stratosphere, followed by the mesosphere, and finally , the thermosphere. The upper boundaries between these layers are termed the tropopause, stratopause, and mesopause respectively.

Temperature changes in the layers are caused by the way solar energy is absorbed as it moves down through the atmosphere. The earth's surface is the main absorber of solar energy. Some of this energy is reflected by Earth as heat, which warms the troposphere. The average global temperature rapidly decreases with increased altitude until you reach the tropopause.

The temperature begins to increase with altitude in the stratosphere. This warming is caused by ozone that absorbs UV radiation from the sun. At the stratopause, the temperature stops increasing. The overlying mesosphere does not absorb solar radiation, so the temperature begins to decrease again. At the mesopause, the temperature begins to increase with altitude, and continues to do so until we reach the thermosphere.

1. Table 1 contains average temperature readings at various altitudes in Earth's atmosphere. *Plot this data of the graph provided. Connect points with a solid line.* The resulting picture gives one a general idea of the temperature conditions in the atmosphere.

Altitude	Temperature	Altitude	Temperature
0	15	52	-2
5	-18	55	-7
10	-49	60	-17
12	-56	65	-33
20	-56	70	-54
25	-51	75	-65
30	-46	80	-79
35	-37	84	-86
40	-22	92	-86
45	-8	95	-81
48	-2	100	-72

2. **Label** the different layers of the atmosphere and the separating boundaries of each layer.
3. Mark the general location of the **ozone layer** and the **ionosphere**.
4. Label the area above the graph **exosphere** (this is where the earth's atmosphere becomes a vacuum.)

Questions

1. What is the basis for dividing the atmosphere into 4 layers?_____
   _____
2. Indicate what happens to temperature as one moves through each layer
   Troposphere_____
   Thermosphere_____
   Mesosphere_____
   Stratosphere_____
3. What is the approximate height and temperature of the tropopause?_____
   of the mesospause_____
   of the stratopause?_____
4. What causes the temperature to increase with height through the stratosphere and decrease with height through the mesosphere?_____
5. What causes the temperature to decrease with height in the troposphere?_____
   _____

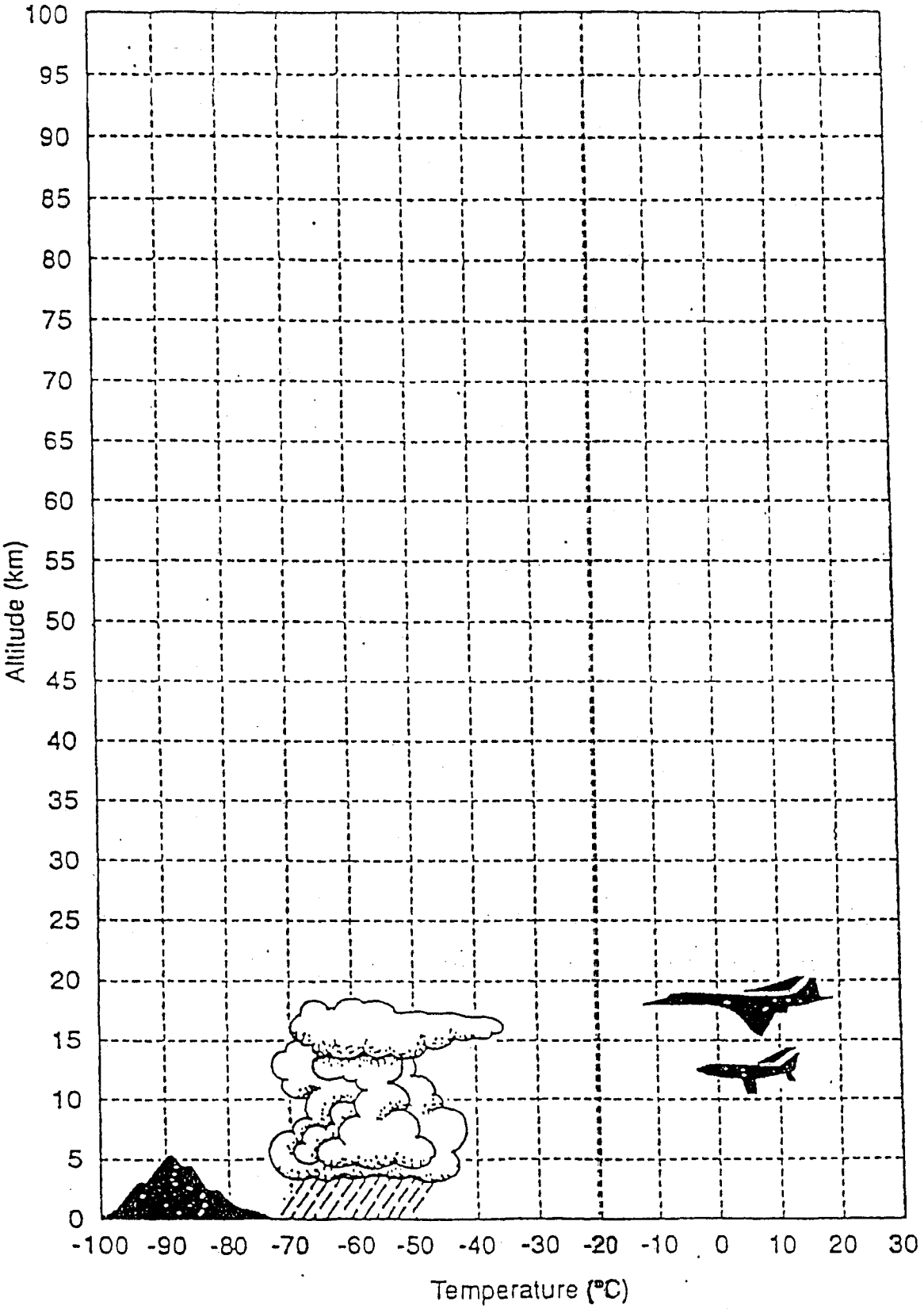

Figure 1. Graph of temperature at various altitudes.