1. Absolute zero on the Celsius temperature scale is $-273.15°C$. What is absolute zero on the Fahrenheit temperature scale?

2. The digital sign outside a local bank reports that the temperature is $44°C$. What is the temperature in degrees Fahrenheit?

3. During an evening news broadcast in Helsinki, Finland, the meteorologist indicated that the day's lowest temperature was $-4.0°C$. What is the corresponding value of this temperature on the Fahrenheit scale?

4. Complete the following statement: Bimetallic strips used as adjustable switches in electric appliances consist of metallic strips that must have different

5. Explain why metal pipes that carry water often burst during cold winter months?

6. The coefficient of linear expansion of steel is $12 \times 10^{-6}/C°$. A railroad track is made of individual rails of steel 1.0 km in length. By what length would these rails change between a cold day when the temperature is $-10°C$ and a hot day at 30 $°C$?

7. The coefficient of linear expansion of aluminum is $23 \times 10^{-6}/C°$. A circular hole in an aluminum plate is 2.725 cm in diameter at $0°C$. What is the diameter of the hole if the temperature of the plate is raised to $100°C$?

8. A metal rod 40.0000 cm long at $40°C$ is heated to $60°C$. The length of the rod is then measured to be 40.0105 cm. What is the coefficient of linear expansion of the metal?

9. A copper plate has a length of 0.12 m and a width of 0.10 m at $25°C$. The plate is uniformly heated to $175°C$. If the linear expansion coefficient for copper is $1.7 \times 10^{-6}/C°$, what is the change in the area of the plate as a result of the increase in temperature?

10. A thin, circular disc is made of lead and has a radius of 0.0350 cm at $20.0°C$. Determine the change in the area of the circle if the temperature is increased to $625.0°C$. The coefficient of linear thermal expansion for lead is $29.0 \times 10^{-6}/C°$.

11. The coefficient of linear expansion of a certain solid is $9 \times 10^{-6}/C°$. Assuming this solid behaves like most solids, what is its coefficient of volume expansion?

12. Zirconium tungstate is an unusual material because its volume shrinks with an increase in temperature for the temperature range 0.3 K to 1050 K (where it decomposes). In fact, the volumetric coefficient of thermal expansion is $-26.4 \times 10^{-6}/K$. Determine the ratio V/V_0 for the above mentioned temperature range. Express your answer in percent.

13. A steel gas tank of volume 0.0700 m3 is filled to the top with gasoline at $20.0°C$. The tank is placed inside a chamber with an interior temperature of $50.0°C$. The coefficient of volume expansion for gasoline is $9.50 \times 10^{-4}/C°$; and the coefficient of linear expansion of steel is $12.0 \times 10^{-6}/C°$. After the tank and its contents reach thermal equilibrium with the interior of the chamber, how much gasoline has spilled?

14. The coefficient of volumetric expansion for gold is $4.20 \times 10^{-5}/C°$. The density of gold is $19\ 300$ kg/m^3 at $0.0°C$. What is the density of gold at 1050 $°C$?

15. A tanker ship is filled with 2.25×10^5 m^3 of gasoline at a refinery in southern Texas when the temperature is $17.2°C$. When the ship arrives in New York City, the temperature is $1.3°C$. If the coefficient of volumetric expansion for gasoline is $9.50 \times 10^{-4}/C°$, how much has the volume of the gasoline decreased when it is unloaded in New York?