42 A company manufactures solid glass spheres. Each sphere has a radius of 2 inches and is packed in a gift box shaped like a cube. The box is small enough so that each side of the box touches the sphere.

a. What is the length, in inches, of each edge of the box? Show or explain how you got your answer.

b. What is the volume, in cubic inches, of the box? Show your work.

Material is added to the spaces around the glass spheres in the boxes to prevent breakage.

c. What is the volume, in cubic inches, of the space inside the box but outside the sphere? Show your work.

The company wants to pack multiple cube-shaped boxes into large boxes for shipping. Each large box is in the shape of a right rectangular prism and has a length of 24 inches, a width of 20 inches, and a height of 16 inches.

d. What is the maximum number of cube-shaped boxes that can fit inside a large box? Show your work.