Written Exercises

A

1. Two cones have radii 6 cm and 9 cm. The heights are 10 cm and 15 cm, respectively. Are the cones similar?
2. The heights of two right prisms are 18 ft and 30 ft. The bases are squares with sides 8 ft and 15 ft, respectively. Are the prisms similar?
3. Two similar cylinders have radii 3 and 4. Find the ratios of the following:
   a. heights **b.** base circumferences **c.** lateral areas **d.** volumes
4. Two similar pyramids have heights 12 and 18. Find the ratios of the following:
   a. base areas **b.** lateral areas **c.** total areas **d.** volumes
5. Assume that the Earth and the moon are smooth spheres with diameters 12,800 km and 3,200 km, respectively. Find the ratios of the following:
   a. lengths of their equators **b.** areas **c.** volumes
6. Two similar cylinders have lateral areas 81π and 144π. Find the ratios of:
   a. the heights **b.** the total areas **c.** the volumes
7. Two similar cones have volumes 8π and 27π. Find the ratios of:
   a. the radii **b.** the slant heights **c.** the lateral areas
8. Two similar pyramids have volumes 3 and 375. Find the ratios of:
   a. the heights **b.** the base areas **c.** the total areas
9. The package of a model airplane kit states that the scale is 1:200. Compare the amounts of paint required to cover the model and the actual airplane. (Assume the paint on the model is as thick as that on the actual airplane.)
10. The scale for a certain model freight train is 1:48. If the model hopper car (usually used for carrying coal) will hold 90 $in.^3$ of coal, what is the capacity in cubic feet of the actual hopper car? (*Hint*: See Exercise 10, page 477.)

11. Two similar cones have radii of 4 cm and 6 cm. The total area of the smaller cone is 36π cm^2. Find the total area of the larger cone.

B

12. A diagonal of one cube is 2 cm. A diagonal of another cube is $4\sqrt{3}$ cm. The larger cube has volume 64 cm^3. Find the volume of the smaller cube.
13. Two balls made of the same metal have radii 6 cm and 10 cm. If the smaller ball weighs 4 kg, find the weight of the larger ball to the nearest 0.1 kg.
14. A snow man is made using three balls of snow with diameters 30 cm, 40 cm, and 50 cm. If the head weighs about 6 kg, find the total weight of the snow man. (Ignore the arms, eyes, nose and mouth.)