

## 113. Comparing Lengths, Areas, and Volumes Using Ratios

### Practice Questions

1. The lengths of two similar rectangles are in the ratio 3:5. What is the ratio of their areas?
2. The sides of two similar triangles are in the ratio 4:7. What is the ratio of their areas?
3. The radii of two similar spheres are in the ratio 2:3. What is the ratio of their volumes?
4. Two similar cubes have edge lengths in the ratio 1:4. Find the ratio of their volumes.
5. A large and small cone are mathematically similar, and their heights are in the ratio 5:2. What is the ratio of their volumes?
6. Two similar circles have diameters in the ratio 3:4. Find the ratio of their areas.
7. The sides of two squares are in the ratio 2:5. Find the ratio of their areas.
8. Two similar prisms have corresponding side lengths in the ratio 6:9. Find the ratio of their volumes.
9. A model car has a scale ratio of 1:10 compared to the real car. What is the ratio of their surface areas?
10. Two cylinders are similar, with a height ratio of 1:3. Find the ratio of their volumes.

### Scenario Questions

1. A map uses a scale of 1:100,000. If two towns are 5 cm apart on the map, how far apart are they in reality?
2. A model ship has a scale ratio of 1:50. If the real ship's height is 25 m, how tall is the model?
3. The areas of two similar gardens are in the ratio 9:16. If the smaller garden has an area of 45 m<sup>2</sup>, find the area of the larger garden.
4. A sculpture is a scaled-up version of a small model. If the ratio of their lengths is 1:8, what is the ratio of their volumes?
5. Two similar storage tanks have volumes in the ratio 27:64. If the smaller tank holds 270 litres, how much does the larger tank hold?
6. A playground model is designed at a scale of 1:20. If the actual swing set is 3 m high, how tall is it in the model?
7. Two planets are similar in shape. If their radius ratio is 5:11, what is the ratio of their surface areas?
8. A photograph is enlarged so that its dimensions are increased by a factor of 3. What happens to its area?
9. Two similar fish tanks have length ratios of 2:5. If the smaller tank holds 40 litres, how much can the larger tank hold?
10. A large pyramid has a volume of 5000 m<sup>3</sup>, and a similar smaller pyramid has a volume of 640 m<sup>3</sup>. Find the ratio of their heights.

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### Practice Questions

1. Ratio of areas: 9:25
2. Ratio of areas: 16:49
3. Ratio of volumes: 8:27
4. Ratio of volumes: 1:64
5. Ratio of volumes: 125:8
6. Ratio of areas: 9:16
7. Ratio of areas: 4:25
8. Ratio of volumes: 216:729 (or 8:27 when simplified)
9. Ratio of surface areas: 1:100
10. Ratio of volumes: 1:27

### Scenario Questions

1. Real distance: 5 km
2. Model height: 0.5 m
3. Area of larger garden: 80 m<sup>2</sup>
4. Ratio of volumes: 1:512
5. Larger tank capacity: 640 litres
6. Model swing set height: 0.15 m
7. Ratio of surface areas: 25:121
8. Area increases by a factor of 9
9. Larger tank capacity: 250 litres
10. Ratio of heights: 5:2