

## Ratios, Rate, Proportions

### Notes

- **Review:**
  - ✓ **Ratio vs. Rate**
  - ✓ **What is a proportion?**
  
- **Ratio and Proportions in Geometry:**  
**Similarity, Linear Dimension Ratio, Area/Volume Ratio**

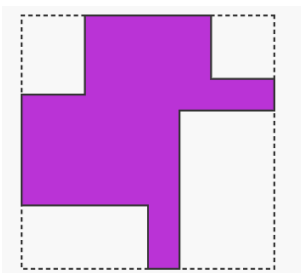
**Discussion Questions**

1. A blueprint has a scale of 2 inches representing 45 ft. How long is a side of a building represented by  $4\frac{2}{3}$  inches?
2. Three numbers in a ratio of 8:3:2 have a sum of 182. What is the difference between the greatest and the least of the three numbers?
3. A bicycle rider climbs a slope at the rate of 50 meters per minute. He descends the same slope at 150 meters per minute. If the round trip takes 24 minutes, how long is the slope?
4. I noticed that 100 kilometers per hour is about the same as 60 miles per hour on the speedometer of my sister's new car. About how many kilometers per hour is 35 miles per hour?
5. The Renaissance Tower in Dallas is 216 m tall. A drawing of the Renaissance Tower is made using a scale in which 6 cm represents 27 m. How tall is the scale drawing of the Renaissance Tower?

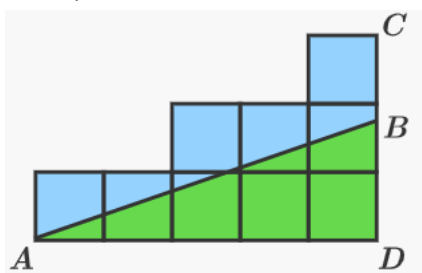
6. The base of a triangle is 4 times as long as the side of a square, and the figures have equal areas. What is the ratio of the altitude of the triangle to the side of the square?

### Practice Questions

7. What is the ratio of the volume of a cube to the surface area of a sphere if the length of a side of the cube and the diameter of the sphere are both  $a$ ?
8. Two rectangular prisms are similar in shape. The first prism has dimensions  $5\text{ m} \times 6\text{ m} \times 11\text{ m}$ , the shortest dimension of the second prism is  $8\text{ m}$ . What is the length of the space diagonal of the second rectangular prism?
9. The figure below is created by removing four rectangular sections from a larger square. What's the ratio of the perimeter of the purple area to the perimeter of the square?]



10. The figure below is created by joining 9 squares together.  $\overline{AB}$  divides the figure so that the two parts are equal in area. What is the value of the ratio  $\frac{DB}{BC}$ ?



- 11\*\* The diagonal of a rectangle is equal to the sum of the shorter side and half the longer side. Find the ratio of the shorter side to the longer.

*(If you solved this question using trial and error, try to solve it again using algebra.)*