

Using ratios

Block 4 Student Activity Sheet



Scale Factor = **1**
Area = **1**



Scale Factor = **2**
Area = **4**



Scale Factor = **3**
Area = **9**

1. You have seen how the measures of the sides of a figure change when you scale a shape. Consider what happens to the area.
 - a. How did the area of the shape change when the dimensions of the shape doubled?

 - b. How did the area change when the dimensions increased by a scale factor of 3?

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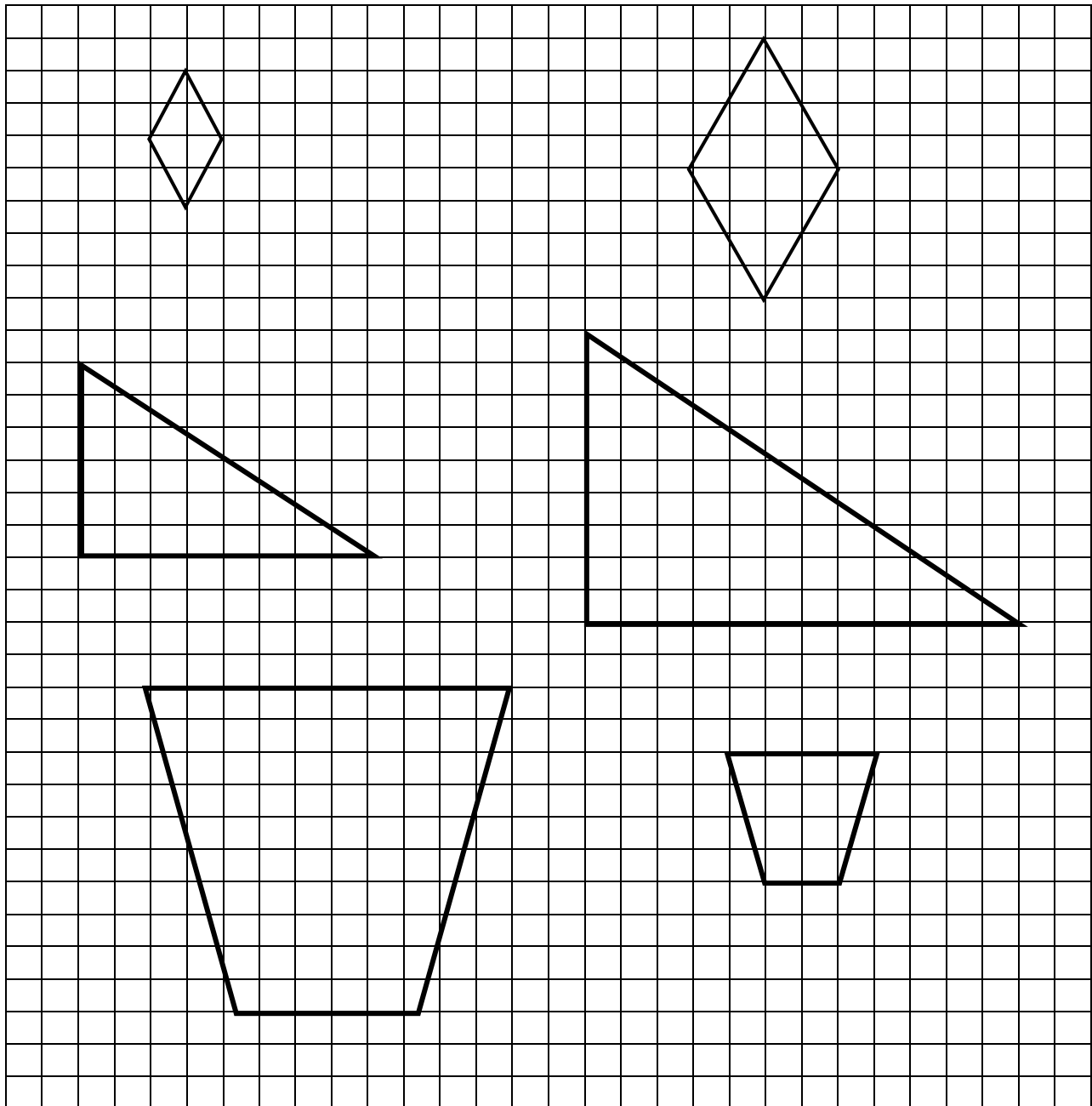
2. You have seen what happens to length and area when you scale a rectangle. Now apply what you have learned to this situation involving two triangles.



- Each side of the small triangle is 1 unit long. How does the side length of small triangle compare to the side length of the large triangle?
- How does the area of the large triangle compare to the area of the small triangle?
- A **linear scale factor** is the factor used to enlarge or reduce lengths. An **area scale factor** tells how many times the area of one figure increases or decreases when a figure is changed proportionally. Use quotients to determine scale factors from the small triangle to the large triangle. What is the linear scale factor? What is the area scale factor?
- Now think about changing in the other direction. Use quotients to determine scale factors from the large triangle to the small triangle. What is the linear scale factor? What is the area scale factor?

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3. **REINFORCE** A linear scale factor is the factor used to enlarge or reduce lengths. An area scale factor tells how many times the area of one figure increases or decreases when a figure is changed proportionally. Determine the linear scale factor used to change each figure on the left to the corresponding figure on the right. Then determine the area scale factor used to change each figure on the left to the figure on the right.

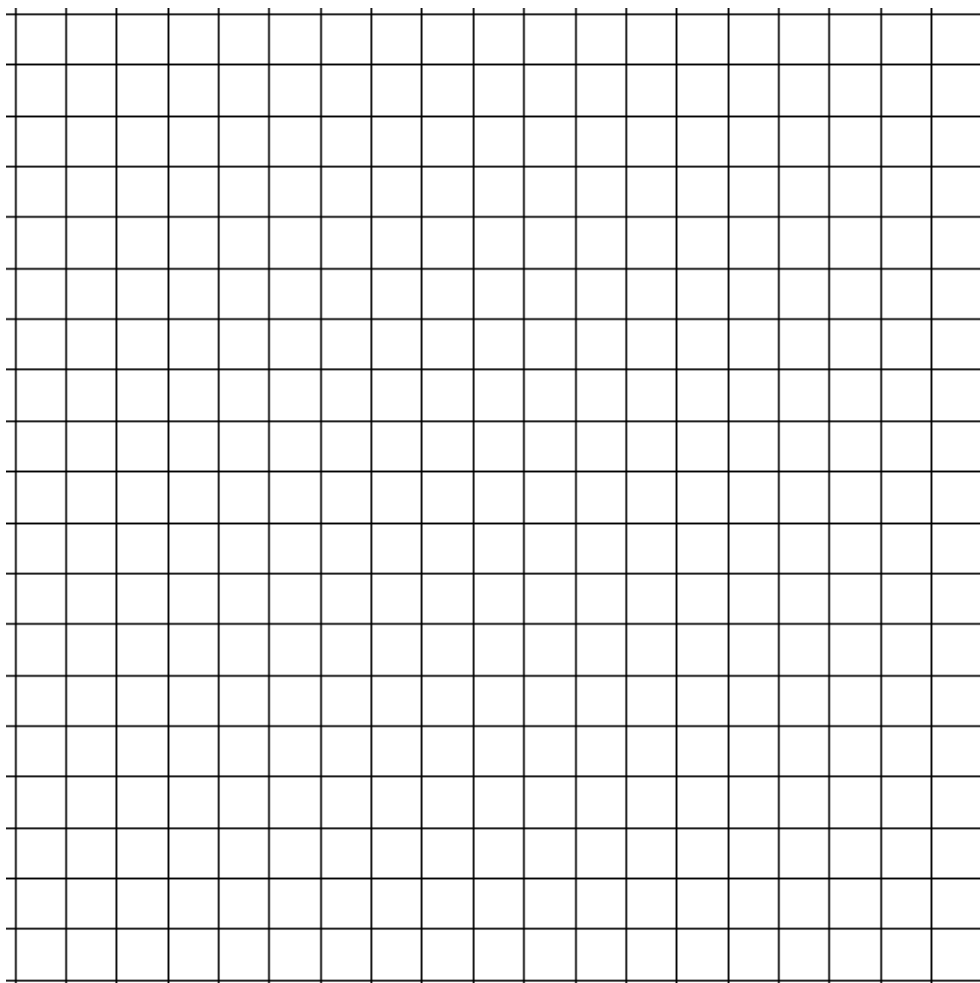


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4. **REINFORCE** Explore increasing a scale factor.

- a. If any size square is increased by a linear scale factor of 5, by what factor is its area increased?

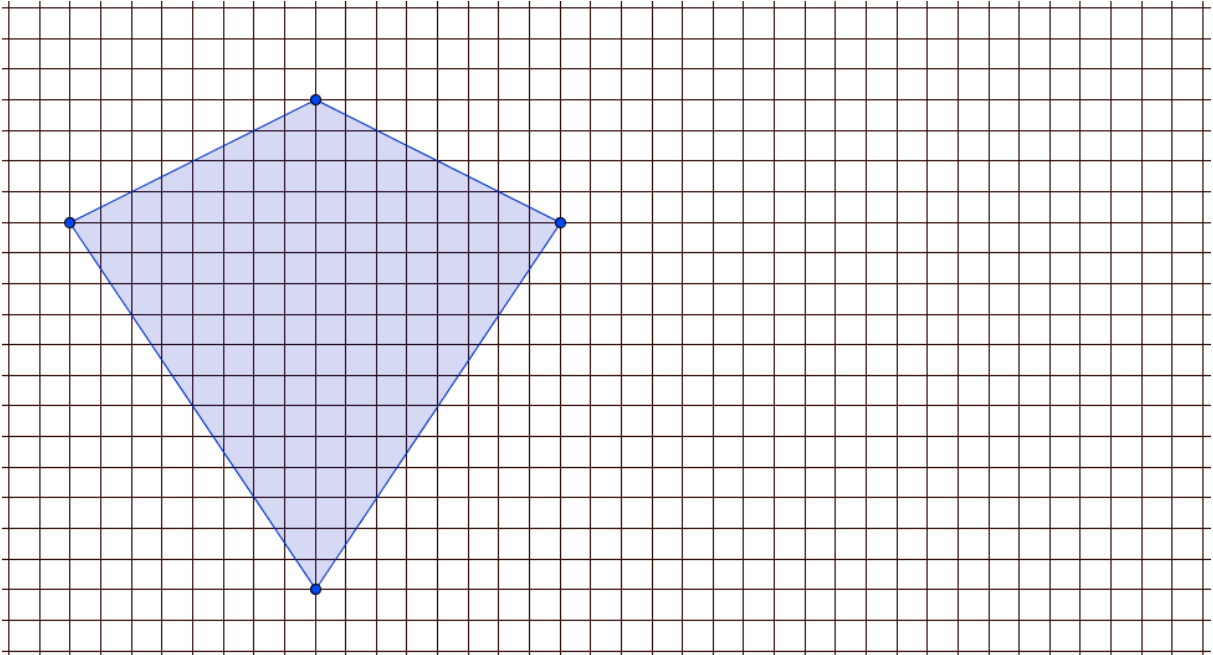
- b. Use the grid to demonstrate part a. Shade in a square that is larger than the unit square and enlarge it by a linear scale factor of 5. Label the side lengths and areas of the original and new squares.



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5. **REINFORCE** Explore reducing a scale factor.

- a. Reduce the quadrilateral by a linear scale factor of $\frac{1}{2}$. Draw the resulting image in the space on the grid.



- b. If the linear scale factor is $\frac{1}{2}$, what is the area scale factor?

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6. **REINFORCE** Keanna’s boss asked her to enlarge a house floor plan by a factor of 4. Keanna is not sure if her boss meant to enlarge the floor plan by a linear scale factor of 4 or an area scale factor of 4. So she decides to do both just in case.

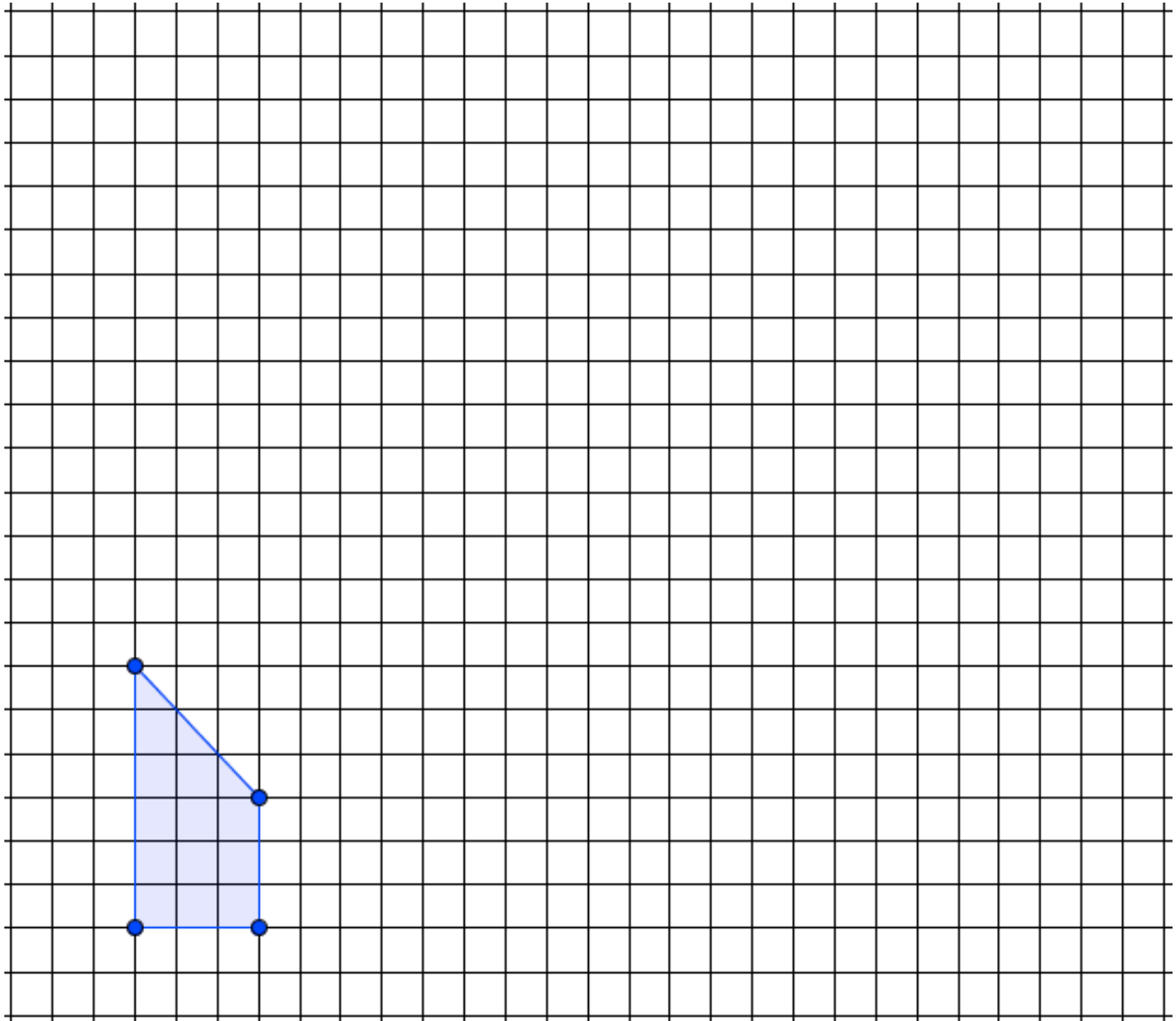


- a. What are the new dimensions of the floor plan if it is enlarged by a linear scale factor of 4?
- b. What are the new dimensions of the floor plan if it is enlarged by an area scale factor of 4?

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7. **REINFORCE** Increase the side lengths of the given quadrilateral by a factor of 3.

a. Draw the resulting figure in the space on the grid.



b. What is the area scale factor that you used to enlarge the quadrilateral?