LAUNCH:

Read the introduction to the lesson on p.278 (everything before the Example)

When you are finished, write a short summary of what you read on a half sheet of paper to be turned in

4.4 Testing for Scale

Objective: Students will decide whether two figures are well-scaled copies of each other

Example

Problem The lengths and widths of seven rectangles A–G are given. Match the rectangles that are scaled copies of each other.

A: 4 in. by 1 in.
B: 3 in. by 2 in.
C: 10 in. by 5 in.
D: 4 in. by 6 in.
E: 5 in. by 3 in.
F: 16 in. by 4 in.
G: 8 in. by 4 in.

$\frac{4}{16} = \frac{1}{4}$ $16:16$

$\frac{10}{8} = \frac{5}{4}$ $40:40$

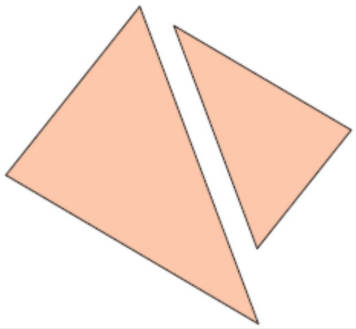
$\frac{3}{6} = \frac{2}{4}$ $12:12$

Solutions There are three pairs of scaled copies. Rectangles C and G are scaled copies (since $\frac{10}{8} = \frac{5}{4}$), as are A and F (since $\frac{4}{16} = \frac{1}{4}$).

Rectangles B and D are also scaled copies. Notice, however, that $\frac{3}{4} \neq \frac{2}{6}$. To see that the rectangles have equal ratios, you need to make your ratios in a consistent way. If one ratio is in the form of $\frac{\text{shorter side}}{\text{shorter side}}$, then the other must be $\frac{\text{longer side}}{\text{longer side}}$. Thus, you have $\frac{2}{4} = \frac{3}{6}$.

Check Your Understanding

1. The ratio of length to width for a particular rectangle is 1.5. A scaled copy has width 6. What is the length of the scaled copy?
2. Two rectangles are scaled copies of each other. The ratio of their lengths is 0.6. The smaller rectangle has width 3. What is the width of the larger rectangle?
3. Are the two triangles below scaled copies of each other? Take measurements and do calculations as necessary. Explain what you find.



4. Kaori has two triangles that have all corresponding angles congruent. The sides of one triangle are 4, 6, and 8. The sides of the other are 9, 6, and 12. She says that because

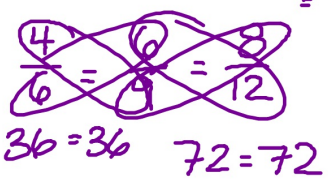
$\frac{4}{9} = 0.44\ldots,$

$\frac{6}{6} = 1,$

and

$\frac{8}{12} = 0.66\ldots,$

the triangles are not scaled copies. Do you agree?



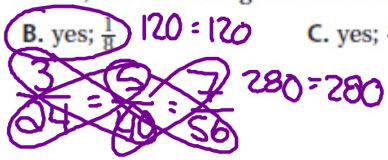
9. **Standardized Test Prep** Elisha has two triangles. One triangle has side lengths of 3 cm, 5 cm, and 7 cm. The other triangle has side lengths of 40 cm, 24 cm, and 56 cm. Are the two triangles scaled copies of each other? If so, what is the scale factor of the first triangle to the second triangle?

A. No, the two triangles are not scaled copies of each other.

B. yes; $\frac{1}{8}$ 120 = 120

C. yes; $\frac{40}{3}$

D. yes; $\frac{24}{5}$



On Your Own

Page 280: 5-8

Page 280: 5-8

5. Can a 3 foot-by-9 foot rectangle be a scaled copy of a 3 foot-by-1 foot rectangle? Explain.

6. You scale a square by the factor 2.5. The resulting square has a side length of 8 inches. What is the length of a side of the original square?

7. One triangle has side lengths of 21, 15, and 18. Another triangle has side lengths of 12, 14, and 16. Are these triangles scaled copies? How can you tell?

8. Carefully trace the triangles below. Cut out the traced triangles. Decide whether any two of the triangles are scaled copies of each other. Use any of the methods discussed in class.