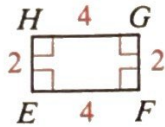
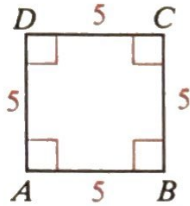


Classroom Exercises

Are the quadrilaterals similar? If they aren't, tell why not.

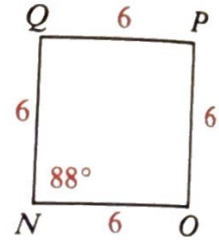
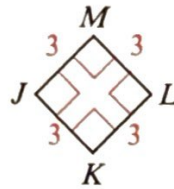
1. $ABCD$ and $EFGH$

3. $ABCD$ and $NOPQ$

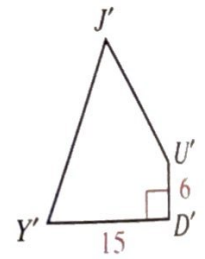
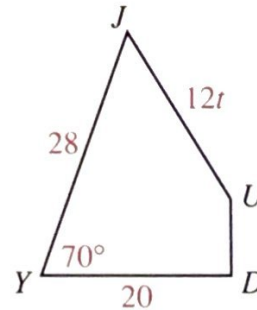


2. $ABCD$ and $JKLM$

4. $JKLM$ and $NOPQ$



5. If the corresponding angles of two polygons are congruent, must the polygons be similar?
6. If the corresponding sides of two polygons are in proportion, must the polygons be similar?
7. Two polygons are similar. Do they have to be congruent?
8. Two polygons are congruent. Do they have to be similar?
9. Are all regular pentagons similar?
10. Quad. $JUDY \sim$ quad. $J'U'D'Y'$. Complete.
 - a. $m\angle Y' = \underline{\quad? \quad}$ and $m\angle D = \underline{\quad? \quad}$.
 - b. The scale factor of quad. $JUDY$ to quad. $J'U'D'Y'$ is $\underline{\quad? \quad}$.
 - c. Find DU , $Y'J'$, and $J'U'$.
 - d. The ratio of the perimeters is $\underline{\quad? \quad}$.
 - e. Explain why it is not true that quad. $DUJY \sim$ quad. $Y'J'U'D'$.



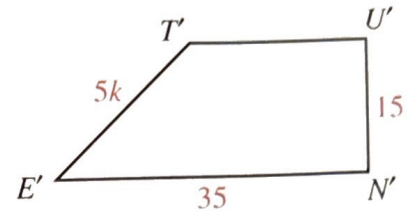
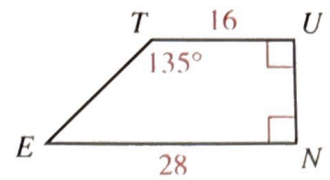
Written Exercises

Tell whether the two polygons are *always*, *sometimes*, or *never* similar.

- | | |
|---|--|
| <p>A</p> <ol style="list-style-type: none"> 1. Two equilateral triangles 3. Two isosceles triangles 5. Two squares 7. Two rhombuses 9. Two regular hexagons 11. A right triangle and an acute triangle 12. An isosceles triangle and a scalene triangle 13. A right triangle and a scalene triangle 14. An equilateral triangle and an equiangular triangle | <ol style="list-style-type: none"> 2. Two right triangles 4. Two scalene triangles 6. Two rectangles 8. Two isosceles trapezoids 10. Two regular polygons |
|---|--|

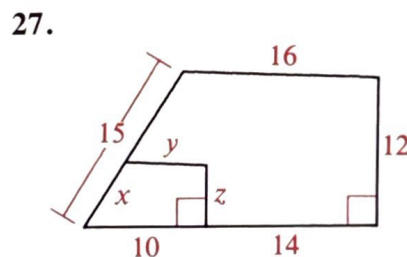
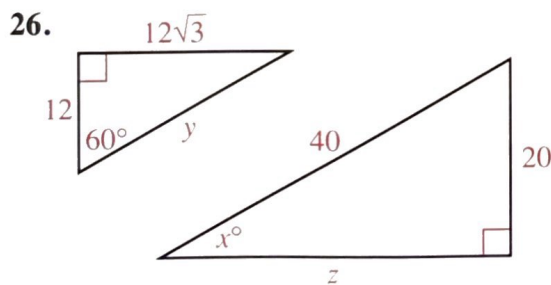
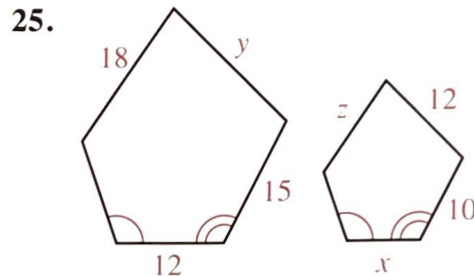
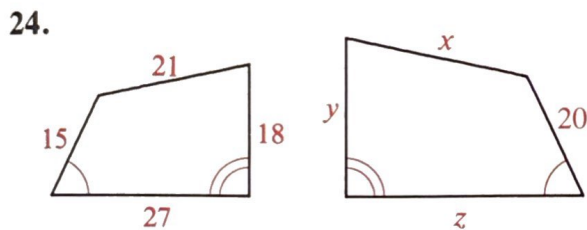
In Exercises 15-23 quad. $TUNE \sim$ quad. $T'U'N'E'$.

- 15. What is the scale factor of quad. $TUNE$ to quad. $T'U'N'E'$?
- 16. What special kind of quadrilateral must quad. $T'U'N'E'$ be? Explain.
- 17. Find $m\angle T'$.
- 18. Find $m\angle E'$.
- 19. Find UN .
- 20. Find $T'U'$.
- 21. Find TE .
- 22. Find the ratio of the perimeters.

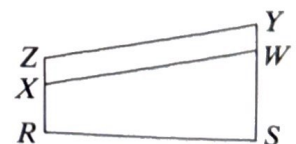


- B** 23. What property of proportions on page 245 would you use to show that the ratio of the perimeters is equal to the ratio of the lengths of any two corresponding sides?

Two similar polygons are shown. Find the values of x , y , and z .



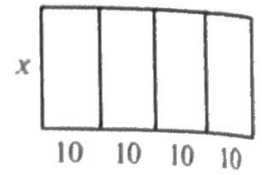
- 28. Draw two equilateral hexagons that are clearly not similar.
- 29. Draw two equiangular hexagons that are clearly not similar.
- 30. If $\triangle ABC \sim \triangle DEF$, express AB in terms of other lengths. (There are two possible answers.)
- 31. Explain how you can tell at once that quadrilateral $RSWX$ is not similar to quadrilateral $RSYZ$.



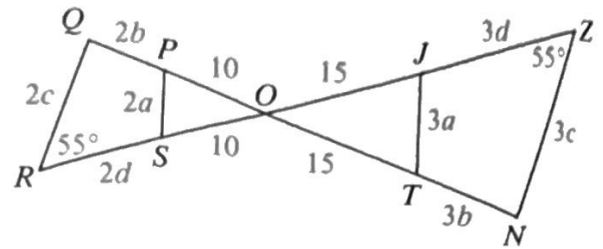
Plot the given points on graph paper. Draw quadrilateral $ABCD$ and $\overline{A'B'}$. Locate points C' and D' so that $A'B'C'D'$ is similar to $ABCD$.

- 32. $A(0, 0)$, $B(4, 0)$, $C(2, 4)$, $D(0, 2)$, $A'(-10, -2)$, $B'(-2, -2)$
- 33. $A(0, 0)$, $B(4, 0)$, $C(2, 4)$, $D(0, 2)$, $A'(7, 2)$, $B'(7, 0)$

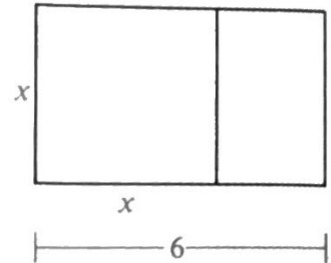
34. The card shown was cut into four congruent pieces with each piece similar to the original. Find the value of x .
35. Quad. *WHAT* is a figure such that $WHAT \sim HATW$. Find the measure of each angle. What special kind of figure must the quadrilateral be?



- C 36. What can you deduce from the diagram shown at the right? Explain.



37. The large rectangle shown is a *golden rectangle*. This means that when a square is cut off, the rectangle that remains is similar to the original rectangle.
- How wide is the original rectangle?
 - The ratio of length to width in a golden rectangle is called the *golden ratio*. Write the golden ratio in simplified radical form. Then use a calculator to find an approximation to the nearest hundredth.



Self-Test 1

Express the ratio in simplest form.

1. 9:15

2. 60 cm to 2 m

3. $\frac{4ab}{6b^2}$

Solve for x .

4. $\frac{x}{8} = \frac{9}{12}$

5. $\frac{x-2}{2} = \frac{x+6}{4}$

6. $\frac{x}{5-x} = \frac{12}{8}$

Tell whether the equation is equivalent to the proportion $\frac{a}{b} = \frac{5}{7}$.

7. $\frac{a}{7} = \frac{b}{5}$

8. $7a = 5b$

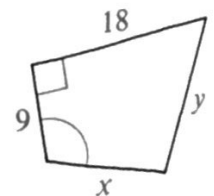
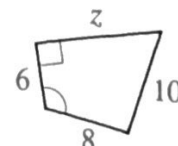
9. $\frac{a+b}{b} = \frac{12}{7}$

10. If $\triangle ABC \sim \triangle RST$, $m\angle A = 45$, and $m\angle C = 60$, then $m\angle R = \underline{\quad}$, $m\angle T = \underline{\quad}$, and $m\angle S = \underline{\quad}$.

The quadrilaterals shown are similar.

11. The scale factor of the smaller quadrilateral to the larger quadrilateral is $\underline{\quad}$.

12. $x = \underline{\quad}$ 13. $y = \underline{\quad}$ 14. $z = \underline{\quad}$



15. The measures of the angles of a hexagon are in the ratio 5:5:5:6:7:8. Find the measures.