4.14

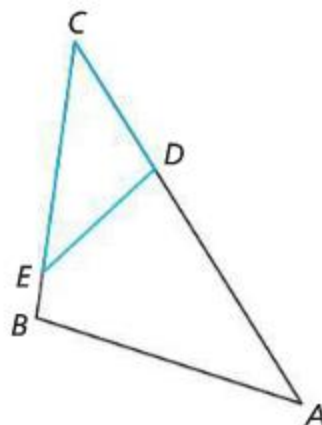**6.** In the figure, $\triangle ABC \sim \triangle CDE$.

Decide whether each statement is correct
or incorrect.

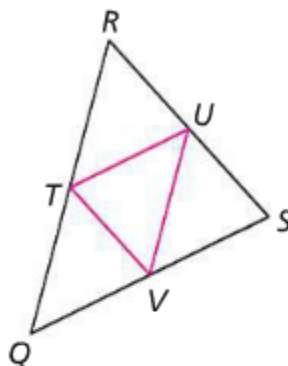**a.** $\triangle ABC \sim \triangle DEC$ **b.** $\triangle BCA \sim \triangle DEC$

c. $\triangle BAC \sim \triangle DEC$ **d.** $\triangle CAB \sim \triangle ECD$

e. $\triangle CBA \sim \triangle ECD$ **f.** $\triangle CBA \sim \triangle CDE$

7. $\triangle QRS \sim \triangle VUT$.

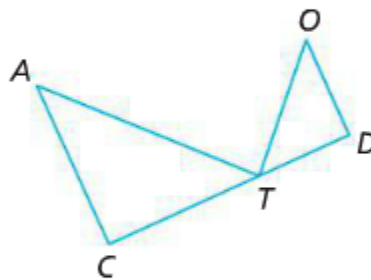Decide whether each statement is correct
or incorrect.

a. $\dfrac{QR}{TU} = \dfrac{SR}{TV}$ **b.** $\dfrac{QR}{SR} = \dfrac{TU}{TV}$

c. $\dfrac{QR}{QS} = \dfrac{UV}{TV}$ **d.** $\dfrac{QT}{QV} = \dfrac{RT}{TU}$

e. $\dfrac{QR}{TV} = \dfrac{SR}{TU}$ **f.** $\dfrac{QS}{VT} = \dfrac{RS}{UT}$

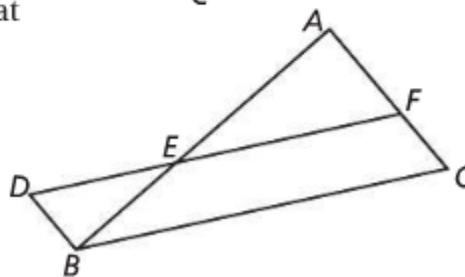**8.** $\triangle CAT \sim \triangle DOT$.

Complete each statement.

a. $\angle C \cong$ __?__   **b.** $\angle CTA \cong$ __?__

c. $\angle DTO \cong$ __?__   **d.** $\angle A \cong$ __?__

e. $\angle D \cong$ __?__   **f.** $\angle O \cong$ __?__

9. **Standardized Test Prep** In the figure at
the right, $\triangle ABC \sim \triangle BED$. Which
length correctly completes the
following proportion?

$$\dfrac{AB}{BE} = \dfrac{AC}{\blacksquare}$$

**A.** BD **B.** ED **C.** BC **D.** EB

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7. The sides of a triangle have lengths 4, 5, and 8. Another triangle similar to it has one side of length 3. What are the lengths of its other two sides? Is more than one answer possible?

8. A triangle has sides of lengths 2, 3, and 4 inches. Another triangle similar to it has a perimeter of 6 inches. What are the side lengths of this triangle?

9. In the figure at the right, $\angle ADE \cong \angle ACB$. Explain why $\triangle ADE \sim \triangle ACB$.
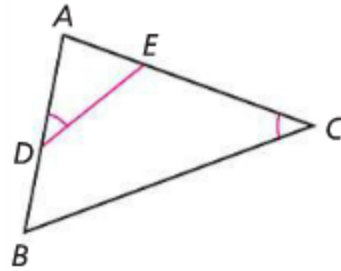
10. In the figure at the right, $AB = 2$ and $BC = 1$. Without making any measurements, find the values of $\frac{AD}{DE}$ and $\frac{AF}{FG}$. Explain how you got your answers.
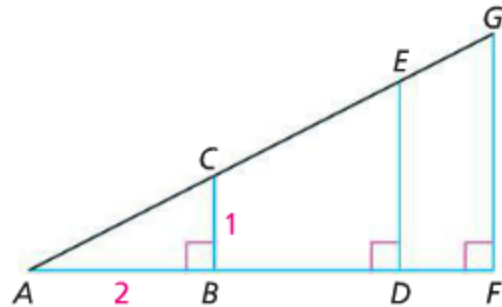
11. Draw a nonisosceles right triangle ABC. Draw the altitude from the right angle to the hypotenuse. The altitude divides $\triangle ABC$ into two smaller right triangles.

    a. There are two pairs of congruent angles (other than the right angles) in your picture. Find and label them.

    b. Make a copy of your triangle. Then cut out the two smaller right triangles. Position them in such a way as to convince yourself that they are similar to each other and to $\triangle ABC$.

   **c.** Explain why all three of these triangles are similar.

12. In the figure at the right, $AB = 4$, $BC = 5$, $AC = 6$, $DC = 2.5$, and $EC = 3$. Prove that $\triangle ABC \sim \triangle EDC$. Find the length of $\overline{DE}$.
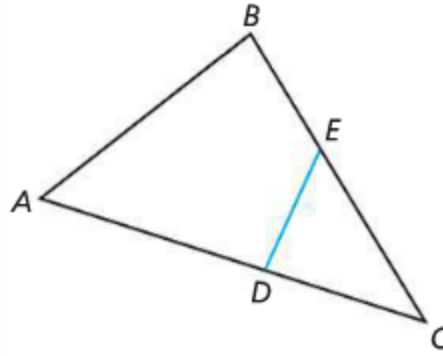
13. Quadrilateral *RATS* is a trapezoid with $\overline{RA} \parallel \overline{ST}$. Diagonals $\overline{RT}$ and $\overline{AS}$ meet at O.
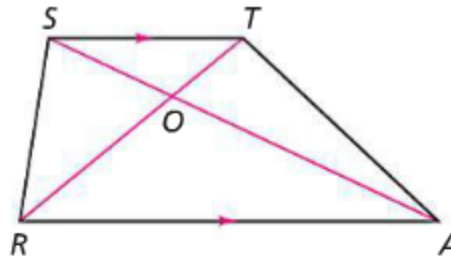
   a. Explain why $\triangle ROA \sim \triangle TOS$.

   b. From part (a) you can say that $\frac{RO}{TO} = \frac{OA}{OS}$. Explain.

   c. Mary Elizabeth knows that $\frac{RO}{TO} = \frac{OA}{OS}$ and $\angle ROS \cong \angle TOA$. She claims that $\triangle ROS \sim \triangle TOA$ by the SAS similarity test. Is this true? Explain.

14. **Take It Further** Take a square sheet of paper. Fold back one fourth of it. You are left with a rectangle. The challenge is to fold the sheet of paper to form a rectangle that is similar to this one, but has half its area. You may not use a ruler.

Fold here.
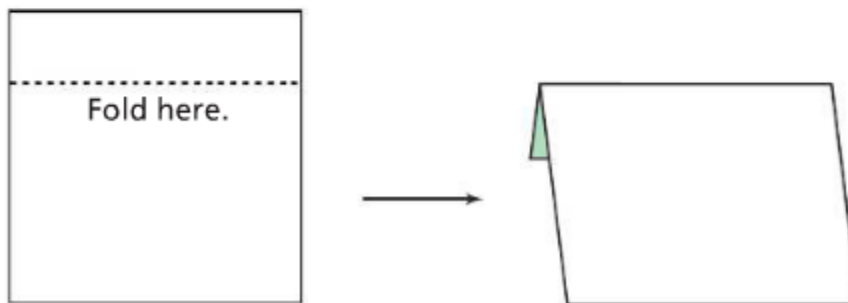
> Even though you have folded part of the square, you can still unfold it and work with the entire square.

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4. The area of one square is 12 times the area of another square. Find the ratio of the lengths of the following.

   a. their sides

   b. their diagonals

5. You scale a rectangle by the factor $\frac{1}{4}$. Compare the area of the scaled rectangle to the area of the original rectangle.

6. You scale a triangle by the factor 5. Compare the area of the scaled triangle to the area of the original triangle.

7. The area of a polygon is 17 square inches. You scale the polygon by the factor 2. What is the area of the new polygon?

8. **Standardized Test Prep** The area of a regular hexagon with 10-cm sides is about 259.8 cm². To the nearest square centimeter, what is the area of a regular hexagon with 5-cm sides?

   A. 130 cm²   **B.** 100 cm²   **C.** 65 cm²   **D.** 52 cm²