ALBERT

Name _____ Date _____

Similar Triangles Worksheet

Geometry · Common Core HSG-SRT.B.5

> Use congruence and similarity criteria for triangles to solve problems and to prove relationships in geometric figures.

Practice

Builds the skill step by step.

1. △ABC ~ △DEF. AB = 6, DE = 9 and BC = 8. What is EF?

2. A 4-foot post casts a 3-foot shadow. At the same time, a tree casts an 18-foot shadow. How tall is the tree?

3. On a map, two similar triangles have a scale of 1 cm : 50 m. A side on the map is 4 cm. How long is the real side?

4. A triangle with sides 3, 4, 5 and one with sides 6, 8, 10. What do you know?

   A. They are not similar.

   B. They are congruent.

   C. They are similar by SSS similarity (all sides in ratio 2).

   D. They are similar by AA only.

5. Two triangles have a 50° angle between sides 4 and 6 in the first and between sides 6 and 9 in the second. They are similar by SAS similarity. What is the scale factor from the first to the second?

6. Two triangles are similar, and $x \div 5 = 12 \div 15$. What is x?

7. Two similar triangles have a scale factor of 2. An altitude of the smaller is 7. What is the matching altitude of the larger?

8. Are triangles with sides 2, 3, 4 and 4, 6, 7 similar?

   A. No, because $4 \div 2 = 6 \div 3$ but $7 \div 4$ is different.

   B. Yes, every side is bigger.

   C. Yes, by SSS similarity.

   D. Yes, by AA.

9. Two similar polygons have perimeters in the ratio 3 : 4. The smaller perimeter is 27. What is the larger?

10. Two similar figures have a scale factor of $\frac{5}{3}$ from the smaller to the larger. The smaller has an area of 18. What is the area of the larger?

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On Level

Grade-level practice.

1. △ABC ~ △DEF. AB = 10, BC = 14, AC = 18 and the perimeter of △DEF is 63. What is DE?

2. △PQR ~ △STU. PQ = 2x + 1, ST = 15, QR = 4 and TU = 10. What is x?

3. A 5-foot student stands 12 feet from a lamppost and casts a 4-foot shadow. The tip of her shadow lines up with the tip of the lamppost's shadow. How tall is the lamppost?

4. Which criterion proves △ABC ~ △DEF if AB = 6, AC = 9, DE = 4, DF = 6 and ∠A ≅ ∠D?

   A. AA

   B. SSS similarity

   C. They are not similar.

   D. SAS similarity

5. To find the width of a river, a surveyor makes similar triangles. The small triangle has legs 10 m and 6 m. In the large triangle, the leg matching 10 m is 45 m. How wide is the river (the leg matching 6 m)?

6. △ABC ≅ △DEF and △DEF ~ △GHI with a scale factor of 2. AB = 5. What is GH?

7. In right $\triangle ABC$, the altitude to the hypotenuse makes segments 5 and 20. How long is the altitude?

8. Two triangles have sides 5, 6, 9 and 10, 12, 18. Are they similar?

   A. Yes, by SAS similarity.

   B. Yes, by SSS similarity with scale factor 2.

   C. They are congruent.

   D. No, the sides are different.

9. A photo 4 inches wide and 6 inches tall is enlarged to be 10 inches wide. How tall is the enlargement?

10. Two similar triangles have areas 12 and 75. What is the ratio of their perimeters, larger to smaller?

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Challenge

Multi-step and word problems that stretch it.

1. △ABC ~ △ADE with D on AB and E on AC. AB = 15, AD = 6, AE = 4. What is EC?

2. A 6-foot ladder leans against a wall and touches it 5 feet up. A similar ladder 9 feet long leans at the same angle. How high up the wall does it touch?

3. AB ∥ DE, and segments AE and BD meet at C (A and E are on one segment, B and D on the other). Prove AC × CD = BC × CE.

4. In right △ABC with right angle C, CD is the altitude to AB. AD = 4 and DB = 9. What is AC?

5. Which pair of triangles is similar?

   A. sides 4, 6, 8 and 6, 9, 12

   B. sides 4, 6, 8 and 5, 7, 9

   C. sides 3, 3, 4 and 4, 4, 3

   D. sides 2, 5, 6 and 4, 10, 11

6. Two similar cones have heights 6 and 9. What is the ratio of their radii, larger to smaller?

7. A 2-meter stick and a building cast shadows of 1.6 m and 24 m. How tall is the building?

8. $\triangle ABC \sim \triangle DEF$. AB = 8, DE = 12 and the area of $\triangle DEF$ is 54. What is the area of $\triangle ABC$?

9. In $\triangle ABC$, a line parallel to BC cuts AB at D and AC at E. AD = 2, DB = 3 and DE = 4. What is BC?

10. A rectangle is 12 by 18. A similar rectangle has a diagonal twice as long. What is its area?