6. Special Triangles

Example: The following relationships exist between the sides of the special triangles.

Use these relationships to solve each of the following problems.

1. Solve for angles $\alpha$ and $\beta$ in the triangle at right.

2. Given a 30-60-90 triangle with hypotenuse length 8, find the exact length of the long leg.

3. A 30-60-90 triangle has a hypotenuse 0.5 inches long. How long is the short leg?

4. Given a 30-60-90 triangle whose long leg is 13 cm, how long is the hypotenuse? (Solve exactly.)

5. Solve for leg lengths $a$ and $b$.

6. Given a 45-45-90 triangle with hypotenuse length $13\sqrt{2}$, how long are the legs?

7. If a 45-45-90 triangle’s legs are 17 mm long, exactly how long is its hypotenuse?

8. What is the exact area of the equilateral triangle whose legs are each 6 cm long?

9. Find the exact area of the following isosceles triangle.
10. A triangle has angles 30°, 60°, and 90°, and its legs have lengths $7\sqrt{3}$, 7, and 14. How long is the side opposite the 60° angle?

11. Solve for $\alpha$ and $\beta$ in the following triangle.

12. If a 30-60-90 triangle has a hypotenuse length 100, how long is the short leg?

13. A 30-60-90 triangle with long leg length $15\sqrt{3}$ has a hypotenuse of what length?

14. Find the area of the triangle at right.

15. Solve for length $x$ in terms of $c$.

16. Solve for lengths $x$ and $y$ in terms of $b$. 

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