

Example The lengths of two sides of a triangle are 3 and 5. The length of the third side must be greater than ?, but less than ?.

Solution Let x be the length of the third side.

$$\begin{array}{rcl} x + 3 > 5 & 3 + 5 > x & x + 5 > 3 \\ x > 2 & 8 > x & x > -2 \end{array}$$

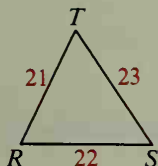
The length of the third side must be greater than 2 but less than 8.

Note that the inequality $x + 5 > 3$ did not give us any useful information. Since $5 > 3$, the sum of 5 and *any* positive number is greater than 3.

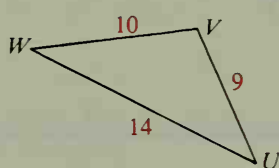
Classroom Exercises

Name the largest angle and the smallest angle of the triangle.

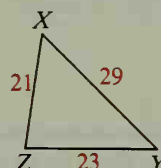
1.



2.

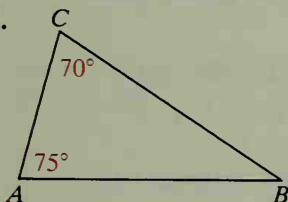


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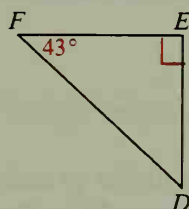


Name the longest side and the shortest side of the triangle.

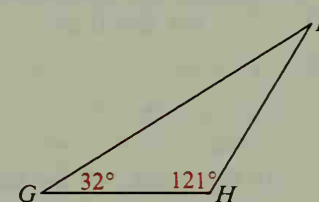
4.



5.



6.



Is it possible for a triangle to have sides with the lengths indicated?

7. 10, 9, 8

8. 6, 6, 20

9. 7, 7, 14.1

10. 16, 11, 5

11. 0.6, 0.5, 1

12. 18, 18, 0.06

13. An isosceles triangle is to have a base that is 20 cm long. Draw a diagram to show the following.

a. The legs can be very long.

b. Although the legs must be more than 10 cm long, each length can be very close to 10 cm.

14. The base of an isosceles triangle has length 12. What can you say about the length of a leg?

15. Two sides of a parallelogram have lengths 10 and 12. What can you say about the lengths of the diagonals?

16. Two sides of a triangle have lengths 15 and 20. The length of the third side can be any number between ? and ?.