Name: _____

Given three numbers: Do they make a triangle?

Solution: Take the smallest two numbers and add them together. If they are bigger than the largest number, then you have a triangle. If they are equal to or smaller, then you don't have a triangle.

Example 1: Given 3, 4, 5

Solution: 3 + 4 = 7, 7 > 5 so triangle

Example 2: Given 3, 6, 9

3 + 6 = 9, 9 not > 9 so *no* triangle

1. **5, 6, 9 Y or N**
2. **2, 8, 11 Y or N**
3. **2, 5, 6 Y or N**
4. **9, 2, 8 Y or N**
5. **6, 3, 2 Y or N**
6. **8, 8, 8 Y or N**

Given two numbers: Find the range of possible values of the third side of the triangle

Solution: Take the two numbers, subtract the smaller from the larger number; this is the lower bound (LB). Add them together; this is the upper bound (UB). The third side must lie between the two bounds: lower bound < third side < upper bound

Example: Given 12 and 19 LB = 19 – 12 = 7 UB = 19 + 12 = 31
So the third side must be bigger than 7, but less than 31. 7 < n < 31

1. **3, 9 < n <**
2. **5, 12 < n <**
3. **7, 3 < n <**
4. **9, 15 < n <**
5. **14, 21 < n <**

Given three sides of a triangle or three angles of a triangle, order the other from largest to smallest (L to S) or smallest to largest (S to L)

Solution: Write the given numbers in correct order (L to S or S to L). Substitute the letter(s) of what the numbers represent. Then substitute the missing letters of the triangle. This gives us the order of the other piece.

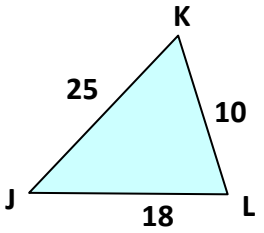
Example 1: Given AB = 3, BC = 6, AC = 5
Arrange angles smallest to largest

Solution:
3 < 5 < 6
AB < AC < BC
∠C < ∠B < ∠A

Example 2: Given ∠A = 30, ∠B = 60, ∠C = 90
Arrange sides largest to smallest

Arrange given in order
Sub in letters
Put in missing letter(s)

90 > 60 > 30
∠C > ∠B > ∠A
AB > AC > BC



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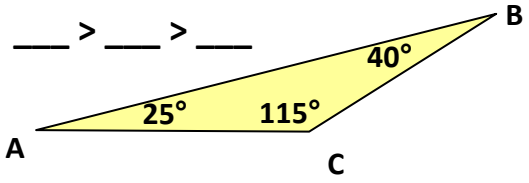

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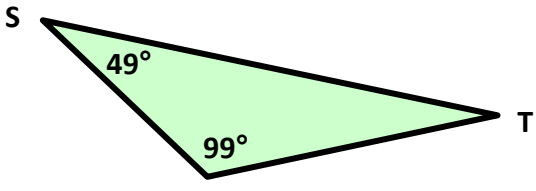

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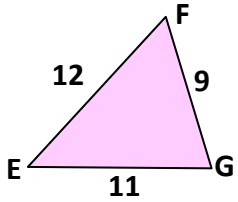

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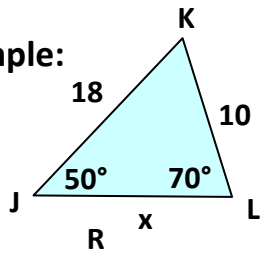
Given two angles and their opposite sides: Find the range of possible values of the third side of the triangle

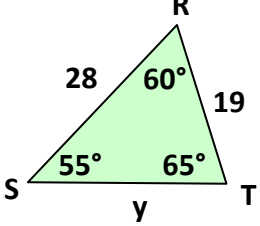
Solution: Find the largest angle (largest side is opposite it). Find the smallest angle (smallest side is opposite it). The third side must lie between the two sides:
smallest side < middle side < largest side

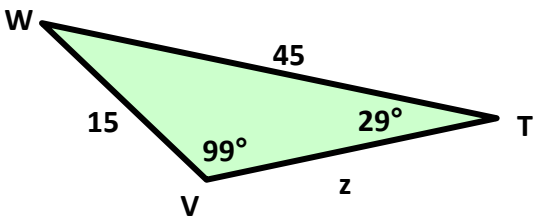
Example:



60 is the missing (middle) angle. 18 is the largest side (opp lg ∠) and 10 is the smallest side (opp sm ∠). So JL must be between the smallest and largest sides: 10 < x < 18

___ < ___ < ___





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