

Triangles – The Basics

Triangle Angle Sum

$$2x + 1 + 5x + 5 + 90 = 180$$

COMBINE LIKE TERMS

$$7x + 96 = 180$$

GET RID OF ADDITION/SUBTRACTION

$$\begin{array}{r} -96 \\ -96 \end{array}$$

$$7x = 84$$

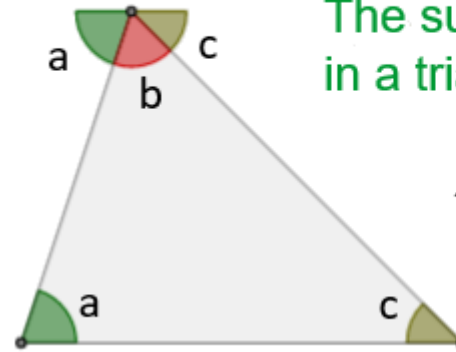
ISOLATE THE VARIABLE

$$\begin{array}{r} /7 \\ /7 \end{array}$$

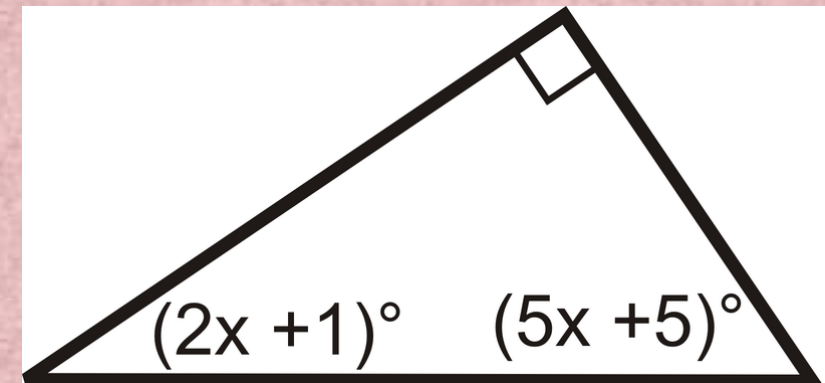
$$x = 12$$

Triangle Sum Theorem

The sum of the three interior angles in a triangle is always 180° .



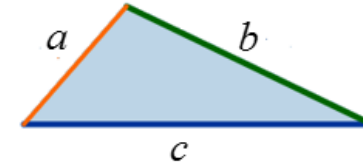
$$\angle a + \angle b + \angle c = 180^\circ$$



Triangle Inequality Theorem

Triangle Inequality Theorem

The sum of the lengths of any two sides of a triangle is greater than the length of the third side.



$$a + b > c$$

$$a + c > b$$

$$b + c > a$$

Sides: 12, 7, 5

$$12 + 7 > 5$$

$$12 + 5 > 7$$

$$\del{5 + 7 > 12}$$

NOT A TRIANGLE

The sum of two sides must be **GREATER** than the third.

Sides: 8, 6, 11

$$8 + 6 > 11$$

$$8 + 11 > 6$$

$$11 + 6 > 8$$

IS A TRIANGLE

The sum of each pair of sides is greater than the third.

Triangle Inequality Theorem

RANGE

Sides: 4cm, 6cm

(finding the largest it could be)

$$4 + 6 > x$$

$$10 > x$$

(finding the shortest it could be)

$$x + 4 > 6$$

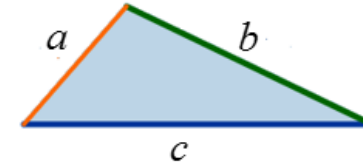
$$x > 2$$

ANSWER: $2 < x < 10$

The length of the third side must be greater than 2cm but less than 10cm

Triangle Inequality Theorem

The sum of the lengths of any two sides of a triangle is greater than the length of the third side.



$$a + b > c$$

$$a + c > b$$

$$b + c > a$$

Finding the range of the third side

***Sometimes you'll only be given two sides of a triangle. You'll need to find what the shortest and largest measurement could be for the third side.**

Small + Medium > Large