In this section we will discuss

* Pythagorean Theorem.
* Special Triangles
* The Distance and Midpoint Formula

## Pythagorean Theorem

Given any Right Triangle with hypotenuse, c and sides of length a and b:

## Special Triangles:

The 45-45-90:

From Geometry we know that the length of a side of any triangle will correspond to its angle.

So if we have a 45-45-90, then we must have a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ triangle

Isosceles

Given the 45-45-90 triangle with hypotenuse of length x, find the length of any of its sides.

The 30-60-90:

Given any 30-60-90 triangle with hypotenuse of length 2x, the length of the shortest side will be x. Find the length of the longer side.

## The Distance Formula:

How might we find the distance of any two points on a number line. (remember that distance is always positive)

So, given the two points on the x-axis the distance between them is

Then the distance between two points in 2-D can be found using the Pythagorean theorem.

Find the distance between two points .

Ex: Find the distances between the points

Ex: Find all points that are a distance of 2 away from the points

## The Midpoint Formula:

If the endpoints of a segment are then the coordinates of the midpoint are .

This means that the midpoint is the average of the x and y coordinates respectively.