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batman16 - November 26, 2017, 7:59 pm

Show that A(-1, -2) B (-4, 2) C(3, 1) are vertices of a right triangle

A triangle with midpt of the longest side is equidistant from its 3 vertices

Formula for finding midpt is $X_m = \frac{X_1 + X_2}{2}$, $Y_m = \frac{Y_1 + Y_2}{2}$.

Help pls ?

Targus - November 27, 2017, 7:26 am

Let's get to the basics of Pythagoras Theorem.

$$a^2 + b^2 = c^2$$

c = largest side value of the triangle (hypotenuse)

a = smallest side value of the triangle (opposite/adjacent)

b = the left out line side value of the triangle (adjacent/opposite)

For a triangle to be an actual right angle triangle, $a^2 + b^2$ MUST be equal to c^2 .

If there are sides 6 cm, 8 cm, and 10 cm in a right angle triangle, then $a = 6$, $b = 8$ and $c = 10$ based on the above logic.

Now let's look at your question.

You will get to see and draw that triangle if you plug those coordinates you got in a graph paper. Based on the triangle, you can see out that BC has the longest line. AC has the shortest line. AB is the "guy in the middle." From that, you can note:

$$BC = c$$

$$AC = a$$

$$AB = b$$

Now that we have the formula to find the distance between two coordinates, we use it to find the actual value of $a/b/c$.

$$BC \Rightarrow B(-4, 2), C(3, 1)$$

$$AC \Rightarrow A(-1, -2), C(3, 1)$$

AB => A (-1, -2), B (-4, 2)

Now we know the values of AB, AC and BC. Let's jump back to the Pythagoras Theorem.

$$a^2+b^2=c^2$$

Since:

$$BC = c$$

$$AC = a$$

$$AB = b$$

Hence,

$$AC^2+AB^2=BC^2$$

Solve AC^2+AB^2 , and see if it matches the value of BC^2 .

$$5^2+5^2=(5\sqrt{2})^2$$

$$25+25=(5\sqrt{2})^2$$

$$50 = (5\sqrt{2})^2$$

$$\sqrt{50} = 5\sqrt{2}$$

$$5\sqrt{2} = 5\sqrt{2}$$

Since $AC^2+AB^2=BC^2$ is proven, the coordinates are A, B and C are confirmed to be vertices of a right angle triangle. Let me know if you don't understand a certain part.

shinlim - November 27, 2017, 8:57 am

Thank you guys! This helps me a lot too.

arkoydas - December 4, 2017, 3:44 pm

I found this community which is related to mathematics subjects only.

<https://math.stackexchange.com/>

It is like stackoverflow but for mathematicians.