Acc Geometry Name________________

4.7 Coordinate Proof Date________

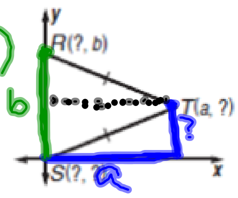
When positioning figures

- Place at least one side on an axis
- Use as few variables as possible for coordinates

Ex 1 Find the missing coordinates of each triangle.

a.

R(0,b)



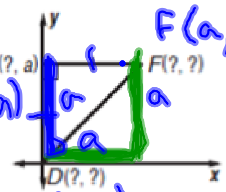

T(a, $\frac{b}{2}$)

S(0,0)

b.

F(a,a)

E(0,a)



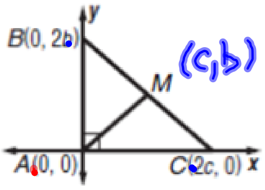

D(0,0)

Another type of proof is called coordinate proof. In this type of proof we will calculate Slope to prove parallel or perpendicular statements, distance to prove congruency and $\left(\frac{x+x}{2}, \frac{y+y}{2}\right)$ to find the coordinates of a midpoint.

Ex 2 Write a coordinate proof.

**Given:** $\triangle ABC$ is a right triangle with hypotenuse $\overline{BC}$.
$M$ is the midpoint of $\overline{BC}$.
**Prove:** $M$ is equidistant from the vertices.

WTS: Am = Bm = Cm (distance)




$$Am = \sqrt{(c-0)^2 + (b-0)^2}$$
$$Am = \sqrt{c^2 + b^2}$$

m is midpoint $\overline{BC}$

$$\left(\frac{x+x}{2}, \frac{y+y}{2}\right)$$
$$\left(\frac{0+2c}{2}, \frac{2b+0}{2}\right)$$
$$(c, b)$$

$$Bm = \sqrt{(c-0)^2 + (2b-b)^2}$$
$$= \sqrt{c^2 + b^2}$$

$$Cm = \sqrt{(2c-c)^2 + (b-0)^2}$$
$$= \sqrt{c^2 + b^2}$$

Because Am = Cm = Bm, ∴ ← therefore
M is equidistant from vertices

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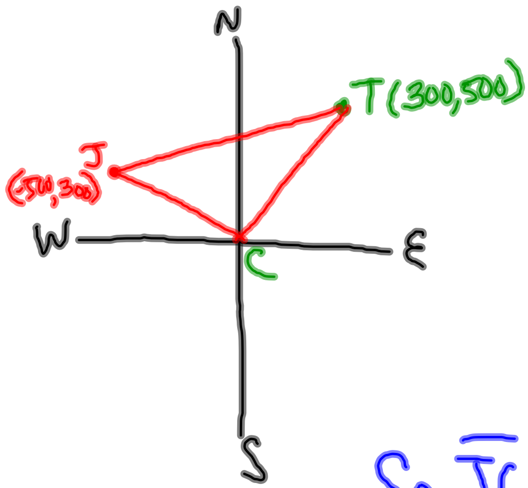
**<u>Ex 3</u>** Tami and Juan are hiking. Tami hikes 300 ft east of the camp and then hikes 500 ft north. Juan hikes 500 ft west of the camp and then 300 ft north. Prove that Juan, Tami and the camp form a right triangle.




$\overline{JC} \perp \overline{TC}$ : WTS

Slope JC $= \frac{300}{-500} = -3/5$

Slope TC $= \frac{500}{300} = 5/3$

So $\overline{JC} \perp \overline{TC}$ which means $\angle C = 90^\circ$ and $\triangle JTC$ is a right $\triangle$.