9.14 Coordinate Proofs: Right Triangles Name: _____

Ways to Prove a Right Triangle

1. Use the distance formula to show $a^2 + b^2 = c^2$.

2. Show you have a right angle by using slopes to prove that two lines are perpendicular.

① $\overline{AC} = 1^2+4^2 = x^2$ $\sqrt{17}$ $\overline{CB} = 3^2+5^2=x^2$ $\sqrt{17}^2+\sqrt{17}^2 \square \sqrt{34}^2$

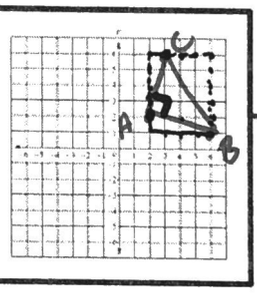
$17 = x^2$ $34 = x^2$ $17+17 \square 34$

$\sqrt{17} = x$ $\sqrt{34} = x$ $34 = 34$ ✓

$\overline{AB} = 1^2+4^2=x^2$ $\sqrt{17}$

Given: A(2, 2), B(6, 1), & C(3, 6)

Prove: ABC is a right triangle in 2 ways



② Slope of

$\overline{AC}$: $\frac{4}{1}$

$\overline{AB}$: $\frac{1}{-4}$

yes, rt Δ bc

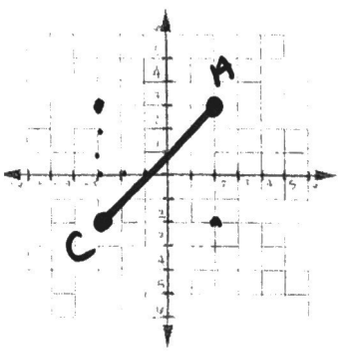
slopes are opp. rec.

Other examples:

1. If AC is the hypotenuse of a right triangle, find two ordered pairs that could represent point B in Triangle ABC.

A(2, 3) and C(–3, –2)

B(-3,3)



B(2,-2)

2. Prove the triangle is a right triangle by using the Pythagorean Theorem.

A(–2, –3), B(–1, 1), & C(3, 0)

$\overline{AB}$: $\sqrt{(-1+2)^2+(1+3)^2} = \sqrt{17}$

$\overline{BC}$: $\sqrt{(3+1)^2+(0-1)^2} = \sqrt{17}$

$\overline{AC}$: $\sqrt{(3+2)^2+(0+3)^2} = \sqrt{34}$

$\sqrt{17}^2+\sqrt{17}^2 \square \sqrt{34}^2$

$34 = 34$ ✓