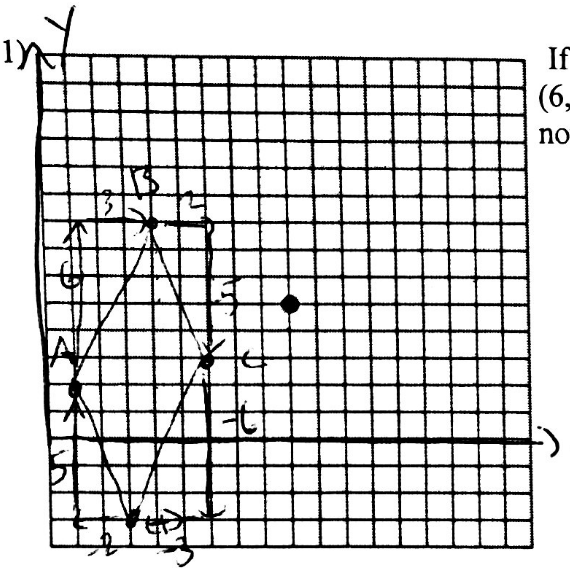
Name: ______________________
Date: ______________________
Class: ______________________

Geometry
Unit 8
HW 8-3

Using the given information and the diagram write a proof that shows the "Prove" statement is true.

1)



If a quadrilateral has points (1, 2), (4, 8), (6, 3), and (3, -3) prove it is parallelogram but not a rhombus.

distances $\not\cong$

slopes $\cong$

slopes

$\overline{AB} \to \frac{6}{3}$

$\overline{BC} \to -\frac{5}{2}$

$\overline{CD} \to \frac{-6}{-3} = \frac{6}{3}$

$\overline{DA} \to -\frac{5}{2}$

distances

$AB + CD \to 6^2 + 3^2 = x^2$

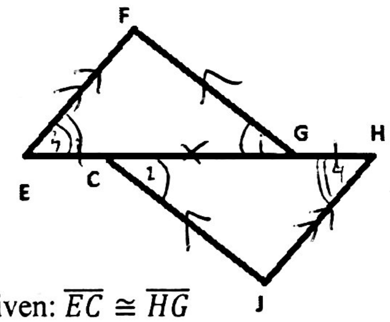
$x = \sqrt{45}$

$BC + DA \to 5^2 + 2^2 = x^2$

$x = \sqrt{29}$

Based on my calculations, ABCD is a ▱ but not a rhombus b/c it has 2 sets of opp ∥ sides (same slope) but does not have 4 $\cong$ sides (dif lengths)

2)



Given: $\overline{EC} \cong \overline{HG}$

$\overline{FG} \| \overline{CJ}$

$\overline{EF} \| \overline{JH}$

Prove: $\overline{EF} \cong \overline{JH}$

$\cong \Delta s$

$\overline{EC} \cong \overline{HG} \to$ given

$\overline{CG} \cong \overline{CG} \to$ anything $\cong$ to itself

$\overline{EG} \cong \overline{CH} \to$ addition property

$\overline{FG} \| \overline{CJ} \to$ given

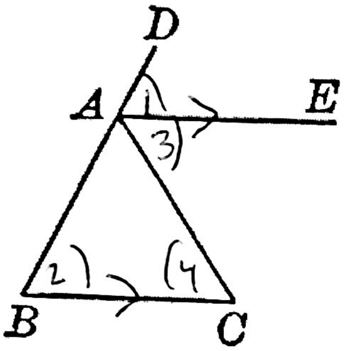
$\angle 1 \cong \angle 2 \to$ alt int $\angle s \cong$ when lines ∥

$\overline{EF} \| \overline{JH} \to$ given

$\angle 3 \cong \angle 4 \to$ alt int $\angle s \cong$ when lines ∥

$\Delta EFG \cong \Delta HJC \to$ ASA

$\overline{EF} \cong \overline{JH} \to$ CPCTC

3) 

Given: $\overline{AE} \parallel \overline{BC}$

$\overline{AE}$ bisects <DAC

Prove: $\triangle$ ABC is isos with <A as vertex

$\cong$ base $\angle$'s or sides

$\overline{AE} \parallel \overline{BC}$ → given

$\angle 1 \cong \angle 2$ → corr $\angle$s $\cong$ when lines $\parallel$

$\overline{AE}$ bisects $\angle DAC$ → given

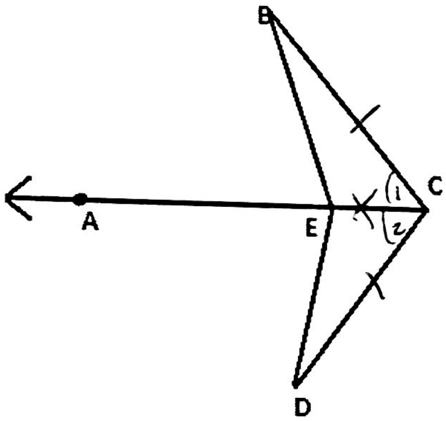
$\angle 1 \cong \angle 3$ → bisector creates 2 $\cong$ parts

$\angle 2 \cong \angle 3$ → Both $\cong \angle 1$

$\angle 3 \cong \angle 4$ → alt int $\angle$'s $\cong$ when lines $\parallel$

$\angle 2 \cong \angle 4$ → Both $\cong \angle 3$

$\triangle ABC$ is isos w/ $\angle A$ as vertex → $\triangle$ w/ 2 $\cong \angle$ is isos.

4) 

Given: $\overline{CA}$ bisects <BCD

$\overline{BC} \cong \overline{CD}$

Prove: $\triangle$ BCE $\cong$ $\triangle$ DCE

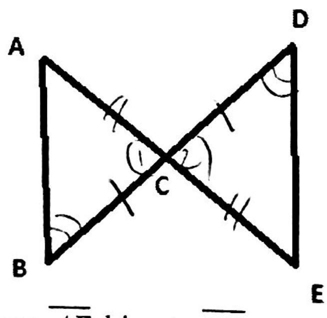
$\overline{CA}$ bisects $\angle BCD$ → given

$\angle 1 \cong \angle 2$ → bisector creates 2 $\cong$ parts

$\overline{BC} \cong \overline{CD}$ → given

$\overline{CE} \cong \overline{CE}$ → any thing $\cong$ to itself

$\triangle BCE \cong \triangle DCE$ → SAS

5) 

Given: $\overline{AE}$ bisects $\overline{BD}$

$\overline{BD}$ bisects $\overline{AE}$

Prove: $\overline{AB} \parallel \overline{DE}$

↑ alt int $\angle$s $\cong$? ✓

$\cong \triangle$'s? ✓

$\overline{AE}$ bisects $\overline{BD}$ → given

$\overline{BC} \cong \overline{CD}$ → bisector creates 2 $\cong$ parts

$\overline{BD}$ bisects $\overline{AE}$ → given

$\overline{AC} \cong \overline{CE}$ → bisector creates 2 $\cong$ parts

$\angle 1 \cong \angle 2$ → vert $\angle$'s $\cong$

$\triangle ACB \cong \triangle ECD$ → SAS

$\angle B \cong \angle D$ → CPCTC

$\overline{AB} \parallel \overline{DE}$ → if alt int $\angle$s $\cong$ then lines $\parallel$