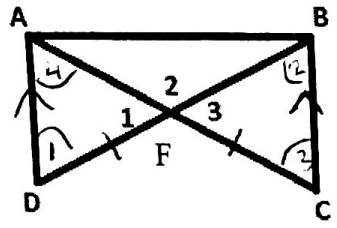
Name: _____
Date: _____
Class: _____

Geometry
Unit 8
HW 8-5

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

1)

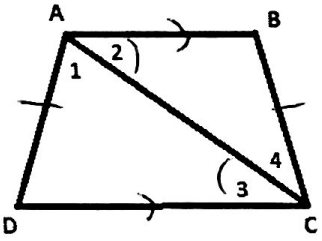


Given: $\overline{AD} \parallel \overline{BC}$
$\overline{DF} \cong \overline{FC}$
$\angle D \cong \angle C$ ($\angle 1 \cong \angle 3$)

Prove: $\triangle$ AFB is isos with <F as vertex

$\overline{AD} \parallel \overline{BC}$ → given
$\angle 1 \cong \angle 2$ → alt int $\angle$'s $\cong$ when lines $\parallel$
$\angle 1 \cong \angle 3$ → Given
$\angle 3 \cong \angle 4$ → alt int $\angle$'s $\cong$ when lines $\parallel$
$\angle 1 \cong \angle 2 \cong \angle 3 \cong \angle 4$ → all $\cong$ to $\angle 1$ or $\angle 3$ which are $\cong$
$\overline{DF} \cong \overline{FC}$ → given
$\triangle DFA \cong \triangle CFB$ → AAS
$\overline{AF} \cong \overline{FB}$ → CPCTC
$\therefore \triangle AFB$ is isos w/ $\angle F$ as vertex → it has 2 $\cong$ legs

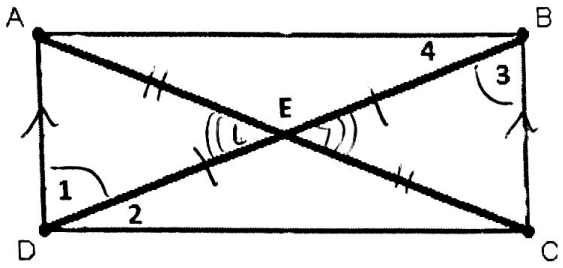
2)



Given: $\angle 2 \cong \angle 3$
$\overline{AD} \cong \overline{BC}$
Prove: $\angle D \cong \angle DCB$ ← isos trap?

$\angle 2 \cong \angle 3$ → given
$\overline{AB} \parallel \overline{DC}$ → if alt int $\angle$'s $\cong$ then lines $\parallel$
$\overline{AD} \cong \overline{BC}$ → given
ABCD is an isos trap → it has 1 set of $\cong$ sides and one set $\parallel$ sides
$\angle D \cong \angle DCB$ → isos trap has $\cong$ base $\angle$'s

3)



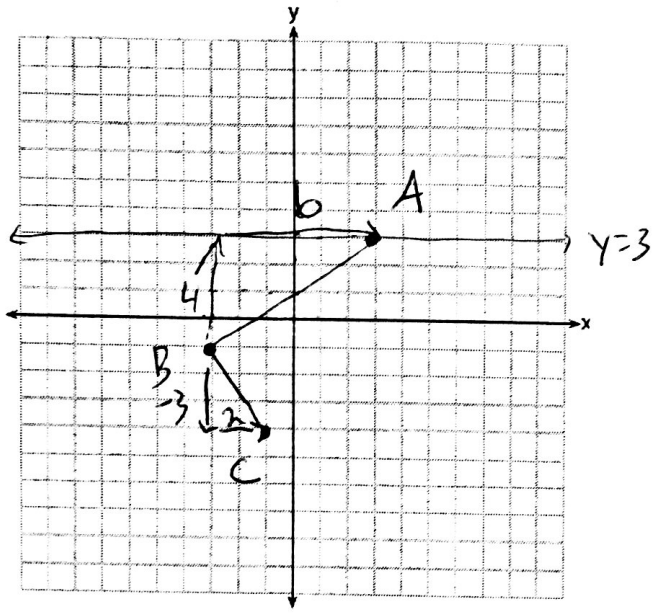
Given: $\overline{AD} \parallel \overline{BC}$
$\overline{AC}$ bisects $\overline{BD}$
$\overline{AD} \perp \overline{DC}$
Prove: ABCD is a rectangle

↑
□ w/ rt $\angle$
□ w/ $\cong$ diags

$\overline{AD} \parallel \overline{BC}$ → given
$\angle 1 \cong \angle 3$ → alt int $\angle$'s $\cong$ when lines $\parallel$
$\overline{AC}$ bisects $\overline{BD}$ → given
$\overline{BE} \cong \overline{ED}$ → bisector creates 2 $\cong$ parts
$\angle 6 \cong \angle 7$ → vert $\angle$'s $\cong$
$\triangle ADE \cong \triangle CBE$ → AS A
$\overline{AE} \cong \overline{EC}$ → CPCTC
ABCD is a □ → it has diags that bisect each other
$\overline{AD} \perp \overline{DC}$ → given
$m\angle ADC$ is 90° → $\perp$ creates rt $\angle$'s
ABCD is a rect → it is a □ w/ a rt $\angle$

4) Triangle ABC has vertices with $A(x,3)$, $B(-3,-1)$, and $C(-1,-4)$.

Determine and state a value of x that would make triangle ABC a right triangle. Justify why $\triangle ABC$ is a right triangle.



* $\triangle$ needs a rt $\angle$ which means neg recip slopes

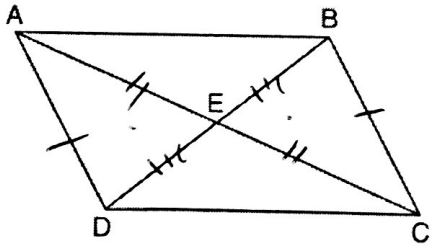
$\overline{BC} \rightarrow -\frac{3}{2}$

$\overline{AB} \rightarrow \frac{2}{3}$ ★

A(3,3) b/c it results in a slope of $\frac{4}{6} = \frac{2}{3}$ which gives a rt $\angle$ at B.

5)

Given: Quadrilateral $ABCD$ is a parallelogram with diagonals $\overline{AC}$ and $\overline{BD}$ intersecting at E



Prove: $\triangle AED \cong \triangle CEB$

ABCD is a $\square$ → given

$\overline{AD} \cong \overline{BC}$ → opp sides of $\square$ are $\cong$

$\overline{AE} \cong \overline{EC}$
$\overline{DE} \cong \overline{EB}$ → diags of a $\square$ bisect each other creating 2 $\cong$ parts

$\triangle AED \cong \triangle CEB$ → SSS