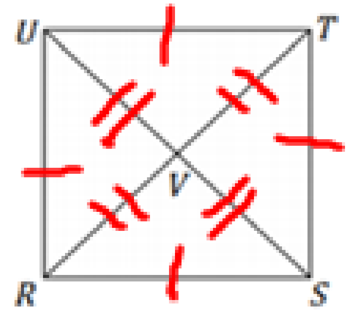
2. Consider the two-column proof below. Put the statements and reasons in the correct order by writing the correct number in the left column.

Given: $RSTU$ is a square.

Prove: $\overline{RT} \perp \overline{SU}$

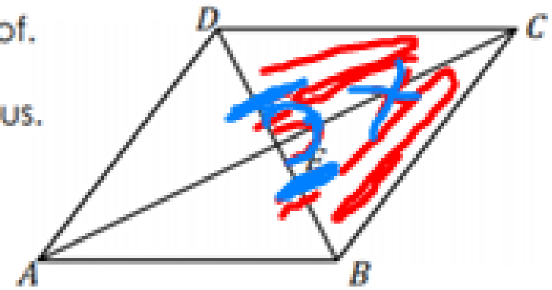


	Statements	Reasons
3	$\overline{UV} \cong \overline{SV} \cong \overline{RV} \cong \overline{TV}$	In a square, diagonals are congruent and bisect each other.
8	$\overline{RT} \perp \overline{SU}$	Definition of bisector
6	$m\angle UVR + m\angle TVU = 180°$ $m\angle RVS + m\angle TVS = 180°$	Linear Pairs
2	$\overline{UT} \cong \overline{TS} \cong \overline{RS} \cong \overline{UR}$	Definition of a square
7	$m\angle UVR = m\angle TVU = m\angle RVS = m\angle TVS = 90°$	Substitution
4	$\Delta UVR \cong \Delta RVS \cong \Delta SVT \cong \Delta TVU$	SSS
1	$RSTU$ is a square.	Given
5	$\angle UVR \cong \angle TVU \cong \angle RVS \cong \angle TVS$	CPCTC

5. Complete following proof.

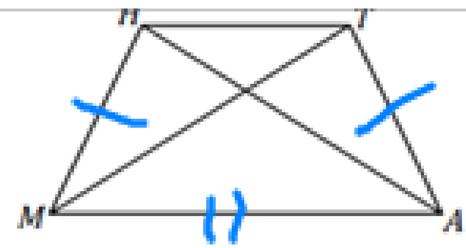
Given: $ABCD$ is a rhombus.

Prove: $\overline{AC}$ bisects $\angle DCB$ of the rhombus.



Statements	Reasons
1. $ABCD$ is a rhombus.	1. Given
2. $\overline{DB} \perp \overline{AC}$	2. Diagonals of a rhombus are perpendicular
3. $\angle DEC$ & $\angle BEC$ are Rt $\angle$'s	3. Definition of perpendicular lines
4. $\angle DEC \cong \angle BEC$	4. All Rt $\angle$'s $\cong$
5. $\overline{DE} \cong \overline{BE}$	5. Diag bisect in a //gram
6. $\overline{EC} \cong \overline{EC}$	6. Reflexive Property
7. $\Delta DEC \cong \Delta BEC$	7. SAS
8. $\angle DCE \cong \angle BCE$	8. CPCTC
9. $\overline{AC}$ bisects $\angle DCB$ of the rhombus.	9. Definition of an angle bisector

1. Complete the following proof.



Given: $MATH$ is an isosceles trapezoid.
Prove: $\angle MHA \cong \angle ATM$

Complete the paragraph proof using the bank of terms below.

It is given that $MATH$ is an isosceles trapezoid. We can prove that $\overline{MH} \cong \overline{AT}$ [Def of IS. Trap]. Then, $\overline{MA} \cong \overline{MA}$ by the [Reflexive]. We can state that $\overline{AH} \cong \overline{MT}$ by using the [Trap diag Theorem]. Now, we have triangles $\Delta HMA \cong \Delta TAM$ by [SSS]. Finally, by using [CPCTC], we can prove that $\angle MHA \cong \angle ATM$.

~~Reflexive Property~~	Midsegment Theorem for Trapezoids
Trapezoid Base Angles Theorem	~~Definition of Isosceles Trapezoid~~
ASA	~~SSS~~
~~Trapezoid Diagonals Theorem~~	Transitive Property
Alternate Interior Angles	~~CPCTC~~

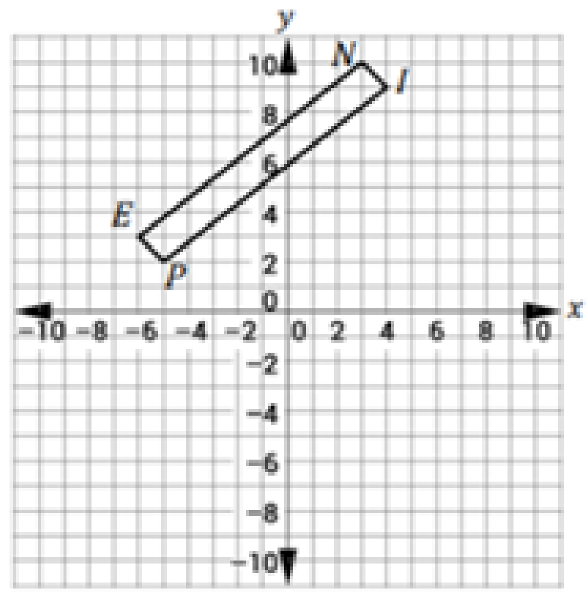
Let's discuss writing proofs using Coordinate Geometry.

- Coordinate geometry involves placing geometric figures in a coordinate plane.
- Coordinate geometry proofs use several kinds of formulas.

Distance Formula	Slope Formula	Midpoint Formula
$d=\sqrt{(x_2-x_1)^2+(y_2-y_1)^2}$ lengths	// or $\perp$ $m=\frac{y_2-y_1}{x_2-x_1}$	bisect $M=\left(\frac{x_1+x_2}{2}, \frac{y_1+y_2}{2}\right)$

Consider the information and figure below.

Given:
PINE is a quadrilateral with vertices at $P(-5,2), I(4,9)$, $N(3,10)$, and $E(-6,3)$.



Prove:
PINE is a parallelogram.

Write a paragraph proof based on the above information and diagram.

$\overline{PE}$ slope is -1 & $\overline{NI}$ slope is -1 & $\overline{EN}$ slope is $\frac{7}{9}$ & $\overline{PI}$ slope is $\frac{7}{9}$
So since $\overline{PE}$ & $\overline{NI}$ have the same slope & $\overline{EN}$ & $\overline{PI}$ have the same slope, opp sides are $\parallel$. Therefore by def PINE is a $\parallel$gram.

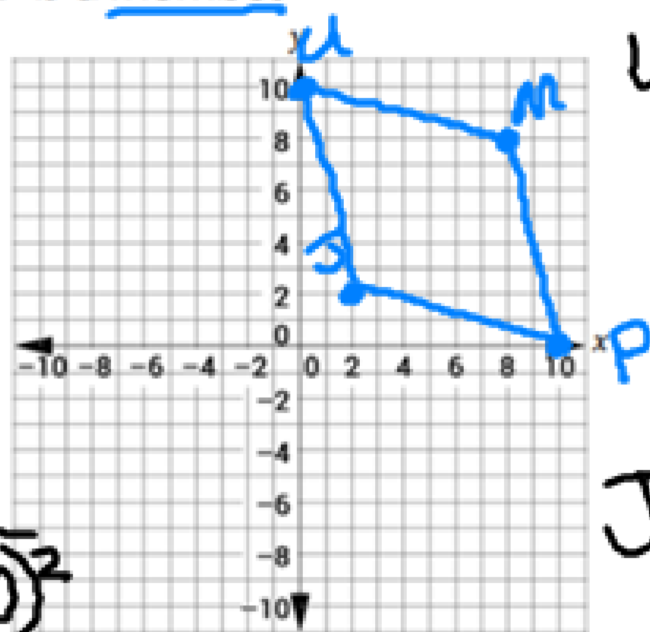
Consider the information below.

Given: $J(2,2), U(0,10), M(8,8), P(10,0)$.
Prove: $JUMP$ is a rhombus

$JU = \sqrt{(2-0)^2 + (2-10)^2}$

$= \sqrt{(2)^2 + (-8)^2}$

$= \sqrt{4+64} = \sqrt{68}$



$UM = \sqrt{(0-8)^2 + (10-8)^2}$

$= \sqrt{(-8)^2 + (2)^2}$

$= \sqrt{64+4} = \sqrt{68}$

$MP = \sqrt{(8-10)^2 + (8-0)^2}$

$= \sqrt{(-2)^2 + 8^2}$

$= \sqrt{4+64} = \sqrt{68}$

so $\overline{JU} \cong \overline{MP}$

$JP = \sqrt{(2-10)^2 + (2-0)^2}$

$= \sqrt{(-8)^2 + 2^2}$

$= \sqrt{64+4} = \sqrt{68}$

so $\overline{UM} \cong \overline{JP}$

By def $\overline{JU} \cong \overline{MP} \cong \overline{UM} \cong \overline{JP}$
JUMP is a Rhombus.