They are either next to each other or they are opposite to each other. In the former case, we call them: adjacent angles (as $\angle 1$ and $\angle 2$ or $\angle 2$ and $\angle 3$) an in the latter, vertical angles (as $\angle 1$ and $\angle 3$ or $\angle 2$ and $\angle 4$). It appears that the pairs of the vertical angles might be equal ($\angle 1 = \angle 3$, $\angle 2 = \angle 4$). A straight angle is an angle whose sides extends in opposite directions from the vertex and lie on a straight line. In the figure, AB is a straight angle with vertex at P. As can be seen, a straight angle is a straight line with a vertex indicated somewhere on it. A formal demonstration is the proof of some geometric principle or property and follows a specific, prescribed form. The following elements are essential:

1. A statement of the proposition to be proved.
2. A lettered diagram showing the figures involved.
3. A breakdown of the proposition into hypotheses (what is given) and conclusion (what is to be proved) in terms of the figure drawn.
4. The body of the proof, consisting of a list of statements, each accompanied by a reason which is an axiom, a postulate, a definition or the result of a previous proof.
5. A final statement which must agree with the conclusion as stated in the original proposition.

4°. An Illustrative Proof.

Let us apply this to the proof of the simple geometric principle noted above. Proposition: Vertical angles are equal.

Given: Straight lines AB and CD intersecting at P.

To Prove: $\angle 1 = \angle 3$ and $\angle 2 = \angle 4$

STATEMENTS	REASONS
1. AB and CD are straight lines intersecting at P.	1. Given
2. AB and CD are straight angles.	2. Definition of straight angle.
3. $\angle 1 + \angle 2$ = straight angle. $\angle 3 + \angle 2$ = straight angle.	3. The whole of a quantity equals the sum of its parts.
4. $\angle 1$ = str. angle minus $\angle 2$. $\angle 3$ = str. angle minus $\angle 2$. (subtracting $\angle 2$ from both sides).	4. If equals are subtracted from equals the remainders are equal.
5. Therefore $\angle 1 = \angle 3$.	5. Quantities equal to the same quantity are equal to each other.

$\angle 4 + \angle 3 = 180°$
$\angle 1 + \angle 4 = 180°$
$\angle 1 + \angle 2 = 180°$
$\angle 2 + \angle 3 = 180°$

$\angle 1 = 180° - \angle 2$
$\angle 3 = 180° - \angle 2$

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