

Chapter 2- Lesson 3

The Game of Proof

In the previous lessons we have solved missing angle puzzles and have developed our skills at building syllogisms. In this lesson we will begin to write *two column proofs* which combine both of these skills: solving geometric puzzles and building syllogisms. Below are *some* building blocks we can use to get started.

Game Pieces

Undefined Terms

1. point
2. line
3. plane

Definitions

4. A straight angle measures 180° .
5. Point B is between points A and $C \Leftrightarrow AB + BC = AC$.
6. An angle is a right angle \Leftrightarrow its measure is 90° .
7. Two angles are complementary \Leftrightarrow the sum of their measures is 90° .
8. $AB = CD$ or $m\angle ABC = m\angle DEF \Leftrightarrow \overline{AB} \cong \overline{CD}$ or $\angle ABC \cong \angle DEF$
9. Two angles are supplementary \Leftrightarrow the sum of their measures is 180° .

Postulates

10. $AB = CD$ or $\overline{AB} \cong \overline{CD} \Leftrightarrow CD = AB$ or $\overline{CD} \cong \overline{AB}$
11. If $a = b$ and $b = c$, then $a = c$.
12. If $a = b$, then a can be substituted for b in any expression or equation.
13. In order to maintain equality, what you do to one side of an equation you must do to the other side.
14. If point B is between points A and C , then $AB + BC = AC$.
15. If P is in the interior of $\angle RST$, then $m\angle RSP + m\angle PST = m\angle RST$.
16. If angles are right angles, then they are congruent.
17. If two angles are vertical, then they are congruent (measures equal).
18. If two angles form a linear pair, then they are supplementary (sum equals 180°).
19. If lines are parallel, then alternate interior angles are congruent.

Name _____

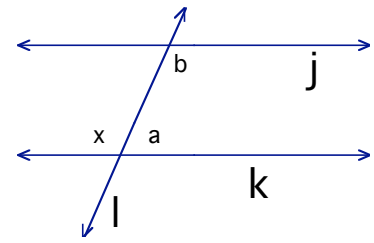
Date _____

Block _____

Proof 1 – Same side interior angles are supplementary.

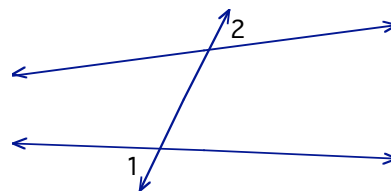
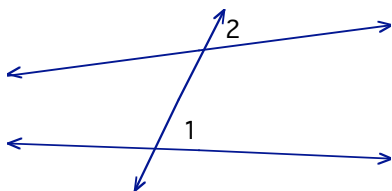
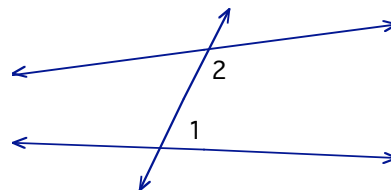
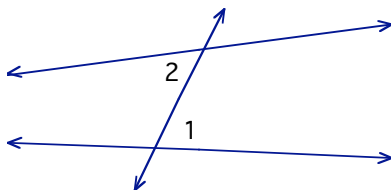
Given: $\vec{j} \parallel \vec{k}$, \vec{l} cuts \vec{j} and \vec{k} .

Prove: $m\angle a + m\angle b = 180^\circ$



Statement	Reason
1.	1.
2.	2.
3.	3.
4.	4.
5.	5.
6.	6.

Name the following angle pairs. Identify the “transversal” in each diagram.



Name _____

Date _____

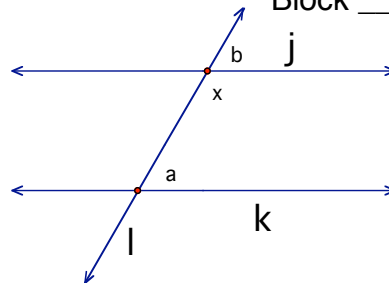
Block _____

Proof 2— Corresponding angles are congruent.

Given: $\vec{j} \parallel \vec{k}$, \vec{l} cuts \vec{j} and \vec{k} .

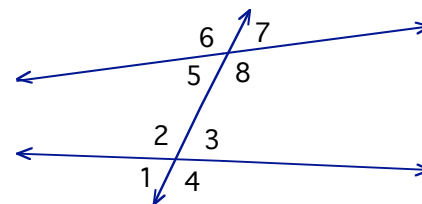
Prove: $m\angle a = m\angle b$

Plan for proof: _____



Statement	Reason
1.	1.
2.	2.
3.	3.
4.	4.
5.	5.
6.	6.
7.	7.

Use the diagram below to identify the angles.



- t. Name the interior angles.
- u. Name the exterior angles.
- v. Name two pairs of alternate interior angles.
- w. Name four pairs of corresponding angles.
- x. Name two pairs of alternate exterior angles.
- y. Name two pairs of same side interior angles.

Name _____

Date _____

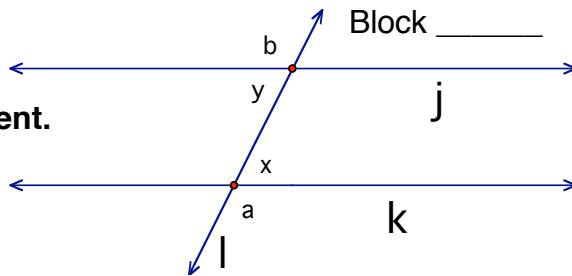
Block _____

Proof 3— Alternate exterior angles are congruent.

Given: $\vec{j} \parallel \vec{k}$, \vec{l} cuts \vec{j} and \vec{k} .

Prove: $m\angle a = m\angle b$

Plan for proof: _____



Statement	Reason
1.	1.
2.	2.
3.	3.
4.	4.
5.	5.
6.	6.
7.	7.
8.	8.

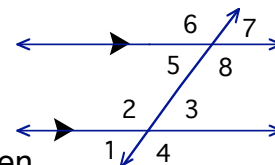
Complete the statements below in four different ways.

If lines are parallel, then

If lines are parallel, then

If lines are parallel, then

If lines are parallel, then



Name _____

Date _____

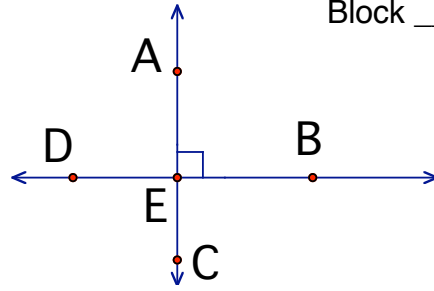
Block _____

Proof 4

Given: $\angle AEB$ is a right angle.

Prove: $\angle DEC$ is a right angle.

Plan for proof: _____



Statement	Reason
1.	1.
2.	2.
3.	3.
4.	4.
5.	5.
6.	6.

Name _____

Date _____

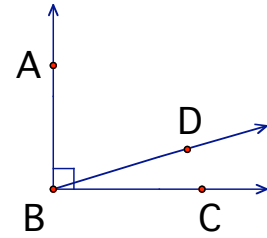
Block _____

Proof 5

Given: $\angle ABC$ is a right angle.

Prove: $\angle ABD$ and $\angle DBC$ are complimentary angles.

Plan for proof: _____



Statement	Reason
1.	1.
2.	2.
3.	3.
4.	4.
5.	5.
6.	6.

Name _____

Date _____

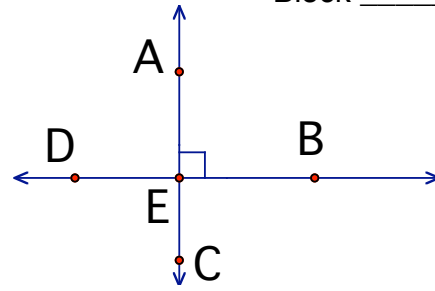
Block _____

Proof 6

Given: $\angle AEB$ is a right angle.

Prove: $\angle BEC$ is a right angle.

Plan for proof: _____



Statement	Reason
1.	1.
2.	2.
3.	3.
4.	4.
5.	5.
6.	6.
7.	7.

Name _____

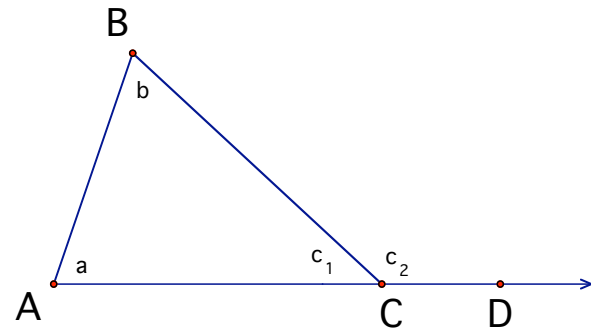
Date _____

Block _____

Proof 7

Prove: $m\angle a + m\angle b = m\angle c_2$

Plan for proof: _____



Statement	Reason
1.	1.
2.	2.
3.	3.
4.	4.
5.	5.
6.	6.