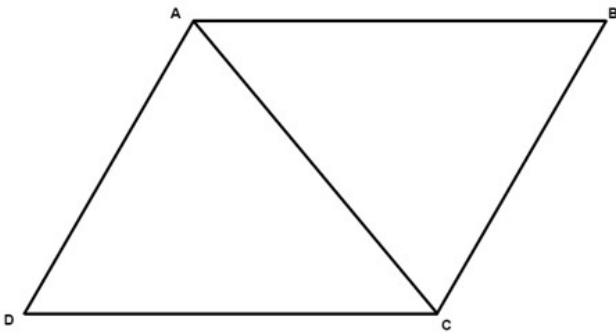Answers and explanations

1. Given ABCD is a parallelogram, prove opposite sides are congruent.

Statement	Reason
ABCD is a parallelogram	Given
$\overline{AB} \parallel \overline{DC}$ and $\overline{AD} \parallel \overline{BC}$	*Definition of a parallelogram*
$< BAC \cong < DCA$	Alternate Interior Angle Theorem
$\overline{AC} \cong \overline{AC}$	Reflexive Property
$< DAC \cong < BCA$	Alternate Interior Angle Theorem
$\triangle ADC \cong \triangle CBA$	*ASA*
$\overline{AB} \cong \overline{DC}$ and $\overline{AD} \cong \overline{BC}$	*CPCTC*

2. If you are proving two triangles are congruent. What are the 5 reasons you could give to support your statement?

1) Side-Angle-Side congruence; 2) Side-Side-Side congruence; 3) Angle-Angle-Side congruence; 4) Angle-Side-Angle congruence; and 5) Hypotenuse-Leg congruence.

3. What must you establish in your proof prior to ever using CPCTC as a reason in your proof?

You must use one of the above postulates to establish that two triangles are congruent before you can use CPCTC.
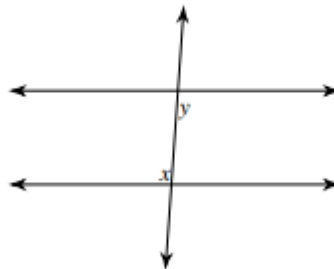
Additional Practice:

Part 1: Identify each pair of angles as 1) Alternate Interior Angles, 2) Alternate Exterior Angles, 3) Corresponding Angles or 4) Same Side Interior Angles (Sometimes called Consecutive Interior Angles)
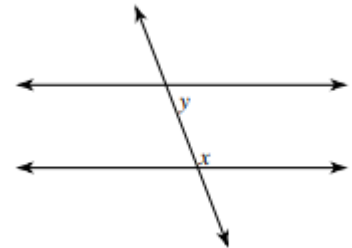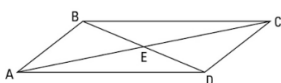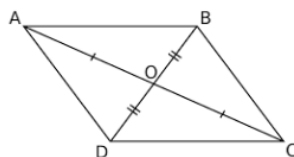
1)
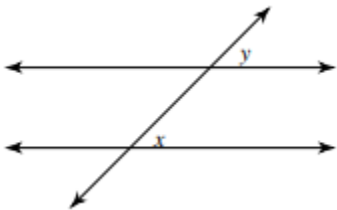
2)

3)

Identify two pairs of alternate interior angles in each of the following.
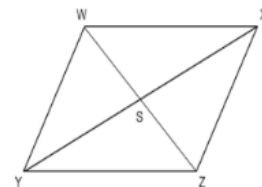
4)

5)

6)

Complete each congruence statement by naming the corresponding angle or side.

7)

$\triangle WXY \cong \triangle XWK$

$\angle YWX \cong ?$

8)

$\triangle LMN \cong \triangle LCD$

$\overline{LM} \cong ?$

9)

$\triangle UTS \cong \triangle HIS$

$\angle T \cong ?$

One of the reasons in each of the below proofs is incorrect. Find the error and state the correct reason.

10)

Given: $\overline{AB} \cong \overline{DE}$, $\overline{BC} \cong \overline{EF}$, $\overline{AC} \cong \overline{DF}$

Prove: $\triangle ABC \cong \triangle DEC$

Statements	Reasons
1. $\overline{AB} \cong \overline{DE}$	1. Given
2. $\overline{BC} \cong \overline{EF}$	2. Given
3. $\overline{AC} \cong \overline{DF}$	3. Reflexive Property
4. $\triangle ABC \cong \triangle DEF$	4. SSS

Where is the error?

What is the correct reason?

11)

Given: $\overline{PN}$ bisects $\angle MNO$, $\overline{MN} \cong \overline{NO}$
Prove: $\triangle MNP \cong \triangle ONP$

Statements	Reasons
1. $\overline{PN}$ bisects $\angle MNO$ $\overline{MN} \cong \overline{NO}$	1. Given
2. $\angle MNP \cong \angle ONP$	2. Alternate Interior Angles of Parallel Lines are Congruent
3. $\overline{NP} \cong \overline{NP}$	3. Reflexive Property
4. $\triangle MNP \cong \triangle ONP$	4. SAS

Where is the error?

What is the correct reason?

12)

Given: $\overline{AB} \cong \overline{CD}$
$\overline{AD} \cong \overline{BC}$
Prove: $\angle A \cong \angle C$

Statements	Reasons
6. $\overline{AB} \cong \overline{CD}$	1. Given
7. $\overline{AD} \cong \overline{BC}$	2. Given
8. $\overline{BD} \cong \overline{DB}$	3. Reflexive Property
9. $\triangle ADB \cong \triangle CDB$	4. SAS
10. $\angle A \cong \angle C$	5. CPCTC

Where is the error?

What is the correct reason?