Objective: *You will learn the angle theorems and use them to solve problems and prove geometric relationships*

Congruent Supplements Theorem: Angles supplementary to the same angle are **congruent**.

140 40 140

Congruent Complements Theorem: Angles complementary to the same angle are **congruent.**

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Right Angles Congruence Theorem: All right angles are congruent.

Linear Pair Postulate: If two angles form a linear pair, then they are supplementary.

Vertical Angles Congruence Theorem: All vertical angles are congruent.

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Example 1: Determine whether the following statements are **always**, **sometimes**, or **never** true.

a. Two angles that are complementary form a right angle. ~~S~~

b. Two angles that are vertical are adjacent. N

c. Two angles that are supplementary are congruent. S

d. Two angles that form a linear pair are supplementary. a

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Example 2: Tomas and Jacob wrote equations involving the angle measures shown. Who is correct? Explain.

Tomas
$m\angle ABE + m\angle EBC = m\angle ABC$

Jacob
$m\angle ABE + m\angle FBC = m\angle ABC$

used AAP correctly

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Example 3: Find the pairs of congruent angles and explain how you know they are congruent.

$\angle 1 \cong \angle 3$ vert. angles Thm (VAT)

$\angle 2 \cong \angle 4$ VAT

$\angle 1 \cong \angle 5$ def of $\cong$

$\angle 3 \cong \angle 5$ def of $\cong$

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Example 4: Solve for x & y.

$\frac{1}{2}y = y - 23x$

$-\frac{1}{2}y = y - 23(4)$

$20x + 8 = 24x - 8$

$8 = 4x - 8$

$16 = 4x$

$4 = x$

$\frac{1}{2}y = y - 92$

$-\frac{1}{2}y = -92$

$y = 184$

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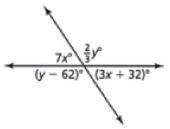
Example 5: Solve for x & y.



$3(\frac{2}{3}y = y - 62)$

$2y = 3y - 186$

$-y = -186$

$y = 186$

$7x = 3x + 32$

$4x = 32$

$x = 8$

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Example 6: Given: ∠1 & ∠5 are right angles

∠5 & ∠8 are supplementary

Prove: ∠3 ≅ ∠8

Statements	Justifications
1. ∠1 & ∠5 are right angles; ∠5 & ∠8 are supplementary	1. Given
2. $m\angle 5 = 90$	2. def of rt ∠.
3. $m\angle 5 + m\angle 8 = 180$	3. def of supp.
4. $90 + m\angle 8 = 180$	4. subst.
5. $m\angle 8 = 90$	5. subtract prop
6. ∠8 is a right angle	6. def of rt ∠.
7. ∠8 ≅ ∠1	7. Rt ∠ ≅ thm
8. ∠1 ≅ ∠3	8. VAT
9. ∠8 ≅ ∠3	9. transitive
10. ∠3 ≅ ∠8	10. symm

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