

Content Objective: I will be able to apply angle relationships to proofs and solve problems with angles.

VERTICAL ANGLE THEOREM:
Vertical angles are congruent.

Vertical angles: $\angle 1 \cong \angle 3$ and $\angle 2 \cong \angle 4$.

EXAMPLE 1:

Oct 9-9:07 AM

EXAMPLE 1:

Since vertical angles are congruent, set the two angles equal to each other:

$15x = 7x + 88$

Vertical angles: $15(11) = 7(11) + 88 = 165^\circ$

Supplementary angles: $180 - 165 = 15^\circ$

Geometry Unit 3 - Reasoning & Proofs w/ Congruent Triangles Page 157

Oct 9-9:08 AM

QUICK CHECK: Find the value of x. Find the vertical angles and supplementary angles.

linear pair

$4x - 101 = 2x + 3$

$-2x - 101 = -2x + 3$

$-101 = 3$

$+101 = +101$

$2x = 104$

$x = 52$

$m\angle AXC = (52) + 3 = 107^\circ$

$m\angle BXC = 4(52) - 101 = 73^\circ$

$m\angle AXB = 180 - 107 = 73^\circ$

$m\angle CXD = 73^\circ$

What is the sum of the angles AXB and AXC? 180°

Oct 9-9:15 AM

Proof of the Congruent Complements Theorem:

Given: $\angle 1$ and $\angle 2$ are complementary
 $\angle 1$ and $\angle 3$ are complementary

Prove: $\angle 2 \cong \angle 3$

Statements	Reasons
1) $\angle 1$ and $\angle 2$ are complementary $\angle 1$ and $\angle 3$ are complementary	1) Given
2) $m\angle 1 + m\angle 2 = 90^\circ$ $m\angle 1 + m\angle 3 = 90^\circ$	2) Def compl \angle s
3) $m\angle 1 + m\angle 2 = m\angle 1 + m\angle 3$	3) Transitive Property of Equality
4) $m\angle 2 = m\angle 3$	4) Subtraction Property of Equality
5) $\angle 2 \cong \angle 3$	5) Def congruent \angle 's

Oct 9-9:21 AM

$m\angle GXB = m\angle BXC = m\angle FXA = m\angle FXE$

a) If $m\angle AXG = 52^\circ$ and $m\angle CXD = 33^\circ$, then $m\angle DXE = 19^\circ$

b) If $m\angle AXB = 28^\circ$, then $m\angle AXG = 62^\circ$

c) If $m\angle GXF = 33^\circ$, then $m\angle GXE = 123^\circ$

d) If $m\angle CYE = 78^\circ$, then $m\angle CYA = 102^\circ$

Oct 9-9:28 AM

$m\angle GXB = m\angle BXC = m\angle FXA = m\angle FXE$

a) If $m\angle AXG = 52^\circ$ and $m\angle CXD = 33^\circ$, then $m\angle DXE = 19^\circ$

b) If $m\angle AXB = 28^\circ$, then $m\angle AXG = 62^\circ$

c) If $m\angle GXF = 33^\circ$, then $m\angle GXE = 123^\circ$

d) If $m\angle CXE = 78^\circ$, then $m\angle CXA = 102^\circ$

Oct 9-9:30 AM

31 NOTES Proofs of Angle Relationships.pdf [Geometry Week 3.1] Day 4) - Go PDF Res...

m∠AXC = _____ m∠BXD = _____

m∠AXB = _____ m∠CXD = _____

What is the sum of the angles AXB and AXC? 180°

∠AXB and ∠AXC form a linear pair.

What is the sum of the angles BXD and CXD? 180°

∠BXD and ∠CXD form a linear pair.

CONGRUENT SUPPLEMENTS THEOREM:
If two angles are supplementary to the same angle (or to congruent angles), then

Oct 9-9:59 AM

31 NOTES Proofs of Angle Relationships.pdf [Geometry Week 3.1] Day 4) - Go PDF Res...

CONGRUENT SUPPLEMENTS THEOREM:
If two angles are supplementary to the same angle (or to congruent angles), then are congruent.

CONGRUENT COMPLEMENTS THEOREM:
If two angles are congruent to the same angle (or to congruent angles), then they complementary congruent.

Geometry Unit 3 - Reasoning & Proofs w/Congruent Triangles

Notes: PROOFS OF ANGLE RELATIONSHIPS

QUICK CHECK Fill in the blank statements

Oct 9-10:00 AM