

1. Geometry NOTES Special Angle Pairs.pdf - [Geometry: Week 1.3] Day 2 - Go PDF Reader

Content Objective: I will be able to identify the relationship between angle pairs such as adjacent, vertical and linear.

TERM	DESCRIPTION	EXAMPLE
PERPENDICULAR LINES	Two lines that intersect to form four right angles . Represented symbolically with this notation: \perp	

Note: Use a different color for each construction.

CONSTRUCTION:
Construct the perpendicular bisector of AB.

CONSTRUCTION:

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Notes: SPECIAL ANGLE PAIRS

EXAMPLE 1: \overleftrightarrow{NP} and \overleftrightarrow{QR} are perpendicular lines intersecting at O. Write an equation in terms of x. Use an algebraic proof to solve for x.

1. $5x - 5 = 90$	1. given
2. $+5 +5$	2. addition
3. $5x = 95$	3. division Simplify
5. $x = 19$	5. division Simplify

QUICK CHECK: Write an equation in terms of x. Use an algebraic proof to solve for x.

1. $6x + 12 = 90$	1. Given
2. $-12 -12$	2. subtraction
3. $6x = 78$	3. Simplify
4. $x = 13$	4. division Simplify

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For items a. – d., use the diagram on the right to name examples of each of the special angle pair relationships formed by intersecting lines.

	NAME	DESCRIPTION	EXAMPLES
a.	ADJACENT ANGLES	Angles that have a common ray and a vertex , but no common interior points.	
b.	NON- ADJACENT ANGLES	Angles that may have a common ray or common interior points.	
c.	VERTICAL ANGLES	Two non-adjacent angles formed by two intersecting lines. Vertical angles are always congruent .	
d.	LINEAR PAIR	Two adjacent angles whose non-common sides are opposite rays . The sum of the measures of the angles in a linear pair is 180 .	

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Vertical angles are congruent, which means that their measures are equal.

The sum of the measures of the angles in a linear pair is 180° .

EXAMPLE 2: \overleftrightarrow{AC} and \overleftrightarrow{DE} intersect at B. Write an equation in terms of x. Use an algebraic proof to find the value of x. Then find the measure of $\angle EBC$.

1. $2x + 20 = 3x + 15$	1. Given
2. $-2x -2x$	2. subtraction
3. $-20 = -x + 15$	3. subtraction
4. $5 = x$	4. Simplify

m \angle EBC = 15°

$\angle EBC = 180 - 30$
 $\angle EBC = 150$

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TERM	DESCRIPTION	EXAMPLE
Supplementary	Two angles that have a sum of 180° .	
Complementary	Two angles that have a sum of 90° .	

EXAMPLE 3: \overleftrightarrow{LN} and \overleftrightarrow{OP} intersect at M. Find the value of x using an algebraic proof and then find the measures of $\angle LMO$ and $\angle OMN$.

1. $12x + 30 + 5x + 10 = 180$	1. given
2. $12x + 30 = 180$	2. combine like terms
3. $-30 -30$	3. subtraction property
4. $12x = 150$	4. division Simplify
5. $x = 12.5$	5. division Simplify
6. $x = 12.5$	6. Simplify

m \angle LMO = 107.5°
m \angle OMN = 72.5°

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EXAMPLE 4: If $\angle 1$ and $\angle 2$ are complements with m $\angle 1 = (2x + 20)^\circ$ and m $\angle 2 = (3x + 15)^\circ$, find the value of x using an algebraic proof.

1. $2x + 20 + 3x + 15 = 90$	1. Given
2. $5x + 35 = 90$	2. Simplify
3. $-35 -35$	3. Subtr
4. $5x = 55$	4. Simplify
5. $x = 11$	5. Div
6. $x = 11$	6. Simplify

QUICK CHECK: If $\angle 1$ and $\angle 2$ are a linear pair with m $\angle 1 = (2x + 8)^\circ$ and m $\angle 2 = (8x + 5)^\circ$, find the value of x using an algebraic proof.

1.	1.
2.	2.

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EXAMPLE 5: Find all of the missing angles and describe the angle pair relationship that you used to determine the measure.

$m\angle 1 = 25^\circ$
 $m\angle 2 = 45^\circ$
 $m\angle 3 = 110^\circ$
 $m\angle 4 = 25^\circ$

$110 + 45 + \angle 1 = 180$
 $\angle 1 = 180 - 155$
 $\angle 1 = 25$

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Notes: SPECIAL ANGLE PAIRS

QUICK CHECK: Find all of the missing angles and describe the angle pair relationship that you used to determine the measure.

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QUICK CHECK: If $\angle 1$ and $\angle 2$ are a linear pair with $m\angle 1 = (2x + 5)^\circ$ and $m\angle 2 = (8x + 5)^\circ$, find the value of x using an algebraic proof.

1. $2x + 5 + 8x + 5 = 180$ Given
2. $10x + 10 = 180$ Simplify
3. $-10 -10$ Subtract
4. $10x = 170$ Simplify
5. $\frac{10x}{10} = \frac{170}{10}$ Divide
6. $x = 17$ Simplify

EXAMPLE 5: Find all of the missing angles and describe the angle pair relationship that you used to determine the measure.

$m\angle 1 = _____\circ$
 $m\angle 2 = _____\circ$
 $m\angle 3 = _____\circ$

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QUICK CHECK: Find all of the missing angles and describe the angle pair relationship that you used to determine the measure.

$m\angle x = 40^\circ$
 $m\angle y = 50^\circ$
 $m\angle z = 40^\circ$
 $m\angle w = 90^\circ$

EXAMPLE 6: $\overleftrightarrow{CD} \perp \overleftrightarrow{AB}$, $m\angle 1 = (6x - 3)^\circ$, $m\angle 2 = (7x - 11)^\circ$. Find the value of x .

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EXAMPLE 6: $\overleftrightarrow{CD} \perp \overleftrightarrow{AB}$, $m\angle 1 = (6x - 3)^\circ$, $m\angle 2 = (7x - 11)^\circ$. Find the value of x .

$6x - 3 + 7x - 11 = 90$
 $x = 4$
 $x = 4$

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