

UNIT 1 PART B STUDY GUIDE: FUNDAMENTALS OF GEOMETRY

Identify each pair of angles as adjacent, vertical, complementary, supplementary, and/or as a linear pair. List all relationships that apply.

15. $\angle PRC$ and $\angle CRB$

adjacent

16. $\angle PRC$ and $\angle HRU$

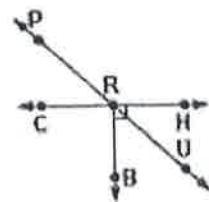
vertical

17. $\angle HRU$ and $\angle BRU$

adjacent
complementary

18. $\angle PRH$ and $\angle HRU$

supplementary
adjacent \rightarrow linear pair



Use the figure to answer each question.

19. If $m\angle ABC = 59$, then find $m\angle CBD$.

$$m\angle ABC + m\angle CBD = 90$$

$$59 + m\angle CBD = 90$$

$$m\angle CBD = 31^\circ$$

20. If $m\angle DBC = 17$, then find $m\angle CBA$.

$$m\angle DBC + m\angle CBA = 90$$

$$17 + m\angle CBA = 90$$

$$m\angle CBA = 73^\circ$$

21. If $m\angle ABC = 2x + 23$ and $m\angle CBD = x + 15$, find x and the measure of each angle.

$$m\angle ABC + m\angle CBD = 90$$

$$2x + 23 + x + 15 = 90$$

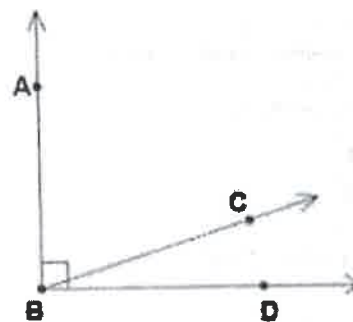
$$3x + 38 = 90$$

$$3x = 52$$

$$x = 17\frac{1}{3}$$

$$m\angle ABC = 57.67^\circ$$

$$m\angle CBD = 32.33^\circ$$



Use the figure to answer each question.

22. If $m\angle PMQ = 79$, $m\angle QML = 3x + 12$, and $m\angle PML = 125$, find x and $m\angle QML$.

$$x = 11.33$$

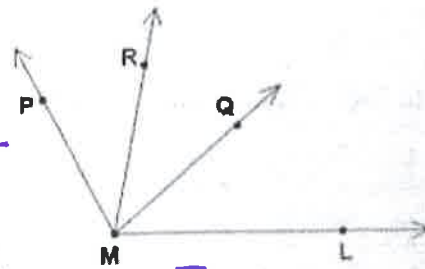
$$m\angle QML = 46^\circ$$

$$m\angle PMQ + m\angle QML = m\angle PML$$

$$79 + 3x + 12 = 125$$

$$91 + 3x = 125$$

$$3x = 34$$



23. If $m\angle RMQ = 3x - 23$, $m\angle QML = 4x + 6$, and $m\angle RML = 5x + 8$, find x and $m\angle RML$.

$$3x - 23 + 4x + 6 = 5x + 8$$

$$7x - 17 = 5x + 8$$

$$2x = 25$$

$$x = 12.5$$

$$m\angle RML = 5(12.5) + 8$$

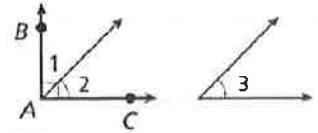
$$m\angle RML = 70.5$$

UNIT 1: PROVING ANGLE RELATIONSHIPS WORKSHEET

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

Prove: $\angle 1$ and $\angle 3$ are complementary.

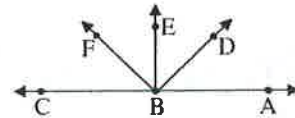
$$\angle 2 \cong \angle 3$$



Statements	Reasons
1. $\angle BAC$ is a right angle.	1. Given
2. $m\angle BAC = 90$	2. def. of a right angle
3. $m\angle BAC = m\angle 1 + m\angle 2$	3. angle addition postulate
4. $m\angle 1 + m\angle 2 = 90$	4. Substitution
5. $\angle 2 \cong \angle 3$	5. Given
6. $m\angle 2 = m\angle 3$	6. def. of congruent \angle 's
7. $m\angle 1 + m\angle 3 = 90$	7. Substitution
8. $\angle 1$ and $\angle 3$ are complementary.	8. def. of complementary \angle 's

Given: $m\angle ABE = m\angle CBE$

Prove: $\angle ABD$ and $\angle DBE$ are complementary.



Statements	Reasons
1. $m\angle ABE = m\angle CBE$	1. Given
2. $m\angle ABE + m\angle CBE = 180$	2. def. of supplementary
3. $m\angle CBE + m\angle CBE = 180$	3. Substitution
4. $2m\angle CBE = 180$	4. Substitution (simplify-combine like terms)
5. $m\angle CBE = 90$	5. division property
6. $m\angle ABE = m\angle ABD + m\angle DBE$	6. angle addition
7. $m\angle CBE = m\angle ABD + m\angle DBE$	7. Substitution
8. $m\angle ABD + m\angle DBE = 90$	8. Substitution
9. $\angle ABD$ and $\angle DBE$ are complementary.	9. def. of complementary \angle 's

UNIT 1: PROVING ANGLE RELATIONSHIPS WORKSHEET

Complete each two column proof.

Given: $\angle 1$ is supplementary to $\angle 2$

Prove: $\angle 1 \cong \angle 3$



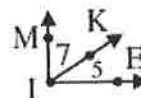
$\angle 3$ is supplementary to $\angle 4$

$\angle 2 \cong \angle 4$

Statements	Reasons
1. $\angle 1$ is supplementary to $\angle 2$, $\angle 3$ is supplementary to $\angle 4$	1. Given
2. $m\angle 1 + m\angle 2 = 180$, $m\angle 3 + m\angle 4 = 180$	2. def. of supplementary
3. $m\angle 1 + m\angle 2 = m\angle 3 + m\angle 4$	3. substitution/transitive
4. $\angle 2 \cong \angle 4$	4. given
5. $m\angle 2 = m\angle 4$	5. def. of congruence
6. $m\angle 1 + m\angle 2 = m\angle 3 + m\angle 2$	6. substitution
7. $m\angle 1 = m\angle 3$	7. subtraction
8. $\angle 1 \cong \angle 3$	8. def. of congruence

Given: $\angle 5$ is complementary to $\angle 7$

Prove: $\overline{MI} \perp \overline{IE}$

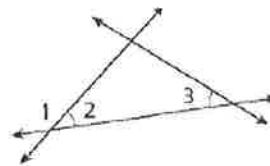


Statements	Reasons
1. $\angle 5$ is complementary to $\angle 7$	1. given
2. $m\angle 5 + m\angle 7 = 90$	2. def. of complementary
3. $m\angle 5 + m\angle 7 = m\angle MIE$	3. angle addition postulate
4. $m\angle MIE = 90$	4. substitution
5. $m\angle MIE$ is a right angle.	5. def. of a right angle
6. $\overline{MI} \perp \overline{IE}$	6. def. of perpendicular lines

UNIT 1: PROVING ANGLE RELATIONSHIPS WORKSHEET

Given: $\angle 2 \cong \angle 3$

Prove: $\angle 1$ and $\angle 3$ are supplementary.



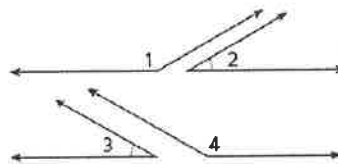
Statements	Reasons
1. $\angle 2 \cong \angle 3$	1. given
2. $m\angle 2 = m\angle 3$	2. def. of congruence
3. $m\angle 1 + m\angle 2 = 180$	3. def. of linear pair/supp.
4. $m\angle 1 + m\angle 3 = 180$	4. substitution
5. $m\angle 1$ and $m\angle 3$ are supplementary $\angle 1$ and $\angle 3$ are supplementary	5. def. of supp. / supp. thm

Given: $\angle 1$ is supplementary to $\angle 2$

Prove: $\angle 1 \cong \angle 4$

$\angle 3$ is supplementary to $\angle 4$

$\angle 2 \cong \angle 3$



Statements	Reasons
1. $\angle 1$ is supplementary to $\angle 2$, $\angle 3$ is supplementary to $\angle 4$	1. given
2. $m\angle 1 + m\angle 2 = 180$, $m\angle 3 + m\angle 4 = 180$	2. def. of supplementary
3. $\angle 2 \cong \angle 3$	3. given
4. $m\angle 2 = m\angle 3$	4. def. of congruence
5. $m\angle 1 + m\angle 2 = m\angle 3 + m\angle 4$	5. transitive / substitution
6. $m\angle 1 + m\angle 2 = m\angle 2 + m\angle 4$	6. substitution
7. $m\angle 1 = m\angle 4$	7. subtraction
8. $\angle 1 \cong \angle 4$	8. def. of congruence