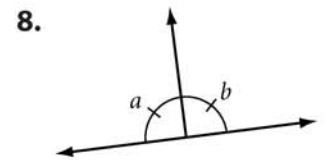
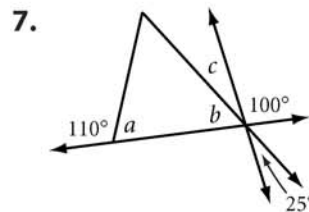
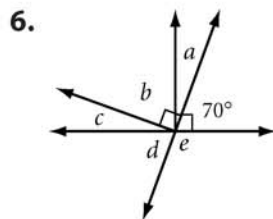
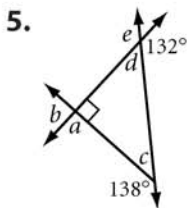
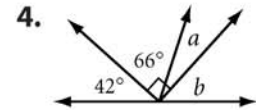
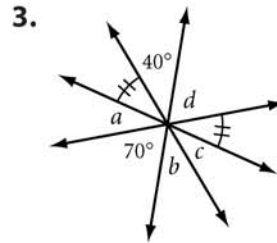
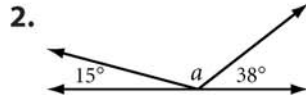
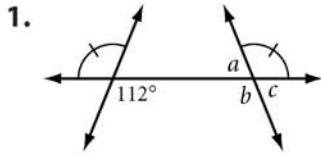


4.1 – Discovering Angle Relationships

For Exercises 1–8, find each lettered angle measure without using a protractor.



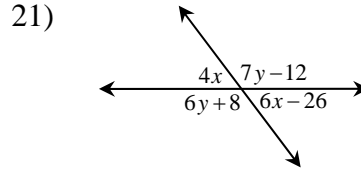
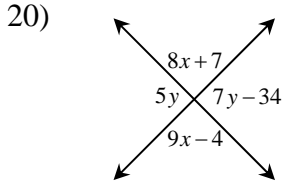
For Exercises 9–14, tell whether each statement is always (A), sometimes (S), or never (N) true.

9. _____ The sum of the measures of two acute angles equals the measure of an obtuse angle.
10. _____ If $\angle XAY$ and $\angle PAQ$ are vertical angles, then either $X, A,$ and P or $X, A,$ and Q are collinear.
11. _____ The sum of the measures of two obtuse angles equals the measure of an obtuse angle.
12. _____ The difference between the measures of the supplement and the complement of an angle is 90° .
13. _____ If two angles form a linear pair, then they are complementary.
14. _____ If a statement is true, then its converse is true.

For Exercises 15–19, fill in each blank to make a true statement.

15. If one angle of a linear pair is obtuse, then the other is _____.
16. If $\angle A \cong \angle B$ and the supplement of $\angle B$ has measure 22° , then $m\angle A =$ _____.
17. If $\angle P$ is a right angle and $\angle P$ and $\angle Q$ form a linear pair, then $m\angle Q$ is _____.
18. If $\angle S$ and $\angle T$ are complementary and $\angle T$ and $\angle U$ are supplementary, then $\angle U$ is a(n) _____ angle.
19. Switching the “if” and “then” parts of a statement changes the statement to its _____.

For #20 and 21, find the values of x and y . SHOW ALL ALGEBRAIC WORK.



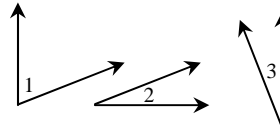
For #22 and 23, find complete the following proof.

22) Prove the **CONGRUENT COMPLEMENTS CONJECTURE**

Given: $\angle 1$ and $\angle 2$ are complements

$\angle 1$ and $\angle 3$ are complements

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



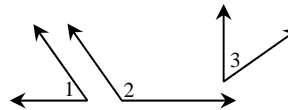
| Statement | Reasons |
|---|----------------------------------|
| 1. $\angle 1$ and $\angle 2$ are complements $\angle 1$ and $\angle 3$ are complements | |
| 2. $m\angle 1 + m\angle 2 = 90^\circ$ $m\angle 1 + m\angle 3 = 90^\circ$ | |
| 3. _____ | Substitution Property |
| 4. _____ | Subtraction Property of Equality |
| 5. $\therefore \angle 2 \cong \angle 3$ | |

23) Prove the **CONGRUENT SUPPLEMENTS CONJECTURE**

Given: $\angle 1$ and $\angle 2$ are supplements

$\angle 3$ and $\angle 2$ are supplements

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



| Statement | Reasons |
|-----------|---------|
| 1. _____ | |
| 2. _____ | |
| 3. _____ | |
| 4. _____ | |
| 5. _____ | |

