Use the diagram at the right. Is each statement true? Explain.

1. \( \angle 5 \) and \( \angle 4 \) are supplementary angles.
   No; they are complementary.

2. \( \angle 6 \) and \( \angle 5 \) are adjacent angles.
   Yes; they have a common side and vertex.

3. \( \angle 1 \) and \( \angle 2 \) are a linear pair.
   Yes; they are adjacent angles whose noncommon sides are opposite rays.

Name an angle or angles in the diagram described by each of the following.

4. a pair of vertical angles
   \( \angle RPQ \) and \( \angle TPU \)

5. supplementary to \( \angle RPS \)
   \( \angle SPU \)
   To start, remember that supplementary angles are two angles whose measures have a sum of 180.

6. a pair of complementary angles
   \( \angle QPR \) and \( \angle RPS \) or \( \angle RPS \) and \( \angle UPT \)
   To start, remember that complementary angles are two angles whose measures have a sum of 90.

7. adjacent to \( \angle TPU \)
   \( \angle SPT, \angle RPT, \angle QPU, \angle RPU, \) and \( \angle QPT \)

For Exercises 8–11, can you make each conclusion from the information in the diagram? Explain.

8. \( \angle CEG \cong \angle FED \)
   Yes; the arcs indicate they are equal.

9. \( DE \equiv EF \)
   Yes; they are marked as \( \cong \).

10. \( \angle BCE \cong \angle BAD \)
    No; not enough information

11. \( \angle ADB \) and \( \angle FDE \) are vertical angles.
    Yes; their sides are opposite rays.

Use the diagram at the right for Exercises 12 and 13.

12. Name two pairs of angles that form a linear pair.
    Answers may vary. Sample: \( \angle NSO \) and \( \angle QSO; \angle NSP \) and \( \angle QSP; \angle OSP \) and \( \angle RSP; \angle OSQ \) and \( \angle RSQ \)

13. Name two pairs of angles that are complementary.
    \( \angle PSQ \) and \( \angle QSR; \angle PSQ \) and \( \angle NSO \)
14. **Algebra**  In the diagram, \( \overrightarrow{XY} \) bisects \( \angle WXZ \).
   
   a. Solve for \( x \) and find \( m\angle WXY \).  \( 5; 28 \)
   
   b. Find \( m\angle YXZ \).  \( 28 \)
   
   c. Find \( m\angle WXZ \).  \( 56 \)

15. **Algebra**  \( \overrightarrow{QR} \) bisects \( \angle PQS \). Solve for \( x \) and find \( m\angle PQS \).

   \[ m\angle PQR = 3x, \quad m\angle RQS = 4x - 9 \quad 9; 54 \]

   \[ m\angle PQS = 4x - 6, \quad m\angle PQR = x + 11 \quad 14; 50 \]

   \[ m\angle PQR = 5x - 4, \quad m\angle SQR = 3x + 10 \quad 7; 62 \]

   \[ m\angle PQR = 8x + 1, \quad m\angle SQR = 6x + 7 \quad 3; 50 \]

19. The measure of one angle is 5 times the measure of its complement.  \( 75 \) and \( 15 \)

20. The measure of an angle is 30 less than twice its supplement.  \( 70 \) and \( 110 \)

21. **Draw a Diagram**  Make a diagram that matches the following description.  *Answers may vary. Sample:*

   - \( \angle 1 \) is adjacent to \( \angle 2 \).
   - \( \angle 2 \) and \( \angle 3 \) are a linear pair.
   - \( \angle 2 \) and \( \angle 4 \) are vertical angles.
   - \( \angle 4 \) and \( \angle 5 \) are complementary.

22. \( m\angle HKJ \)  \( 90 \)

23. \( m\angle IKJ \)  \( 42 \)

24. \( m\angle FKG \)  \( 42 \)

25. \( m\angle FKH \)  \( 132 \)

26. \( m\angle FKJ \)  \( 138 \)

27. \( m\angle GKI \)  \( 138 \)