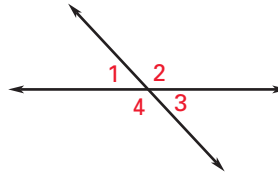




Use the diagram to decide whether the statement is *true* or *false*.

- If $m\angle 1 = 47^\circ$, then $m\angle 2 = 43^\circ$.
- If $m\angle 1 = 47^\circ$, then $m\angle 3 = 47^\circ$.
- $m\angle 1 + m\angle 3 = m\angle 2 + m\angle 4$.
- $m\angle 1 + m\angle 4 = m\angle 2 + m\angle 3$.

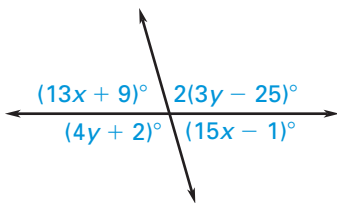


Make a sketch of the given information. Label all angles which can be determined.

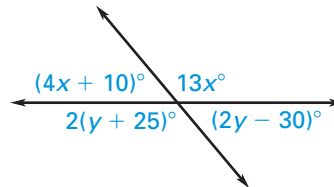
- Adjacent complementary angles where one angle measures 42°
- Nonadjacent supplementary angles where one angle measures 42°
- Congruent linear pairs
- Vertical angles which measure 42°
- $\angle ABC$ and $\angle CBD$ are adjacent complementary angles. $\angle CBD$ and $\angle DBF$ are adjacent complementary angles.
- $\angle 1$ and $\angle 2$ are complementary. $\angle 3$ and $\angle 4$ are complementary. $\angle 1$ and $\angle 3$ are vertical angles.

Find the value of the variables and the measure of each angle in the diagram.

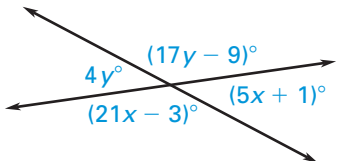
11.



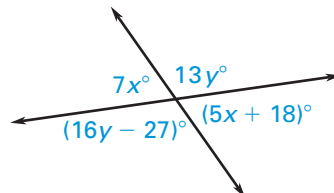
12.



13.



14.



15. **Error Analysis** Describe the error in making the statements about the diagram.

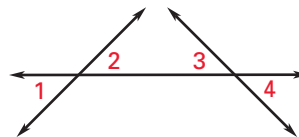
$\angle 1 \cong \angle 3$ and $\angle 2 \cong \angle 4$ X

Exercise Set A *(continued)*

In Exercises 16 and 17, copy and complete the proof.

16. GIVEN: $\angle 2 \cong \angle 3$

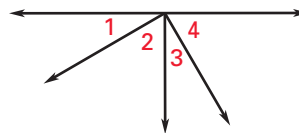
PROVE: $\angle 1 \cong \angle 4$



Statements	Reasons
1. $\angle 2 \cong \angle 3$	1. ?
2. $\angle 3 \cong \angle 4$	2. ?
3. $\angle 2 \cong \angle 4$	3. ?
4. $\angle 1 \cong \angle 2$	4. ?
5. $\angle 1 \cong \angle 4$	5. ?

17. GIVEN: $\angle 1$ and $\angle 2$ are complementary.
 $\angle 1 \cong \angle 3$, $\angle 2 \cong \angle 4$

PROVE: $\angle 3$ and $\angle 4$ are complementary.



Statements	Reasons
1. $\angle 1$ and $\angle 2$ are complementary.	1. ?
2. $m\angle 1 + m\angle 2 = 90^\circ$	2. ?
3. $\angle 1 \cong \angle 3$, $\angle 2 \cong \angle 4$	3. ?
4. $m\angle 1 = m\angle 3$, $m\angle 2 = m\angle 4$	4. ?
5. $m\angle 3 + m\angle 2 = 90^\circ$	5. ?
6. $m\angle 3 + m\angle 4 = 90^\circ$	6. ?
7. $\angle 3$ and $\angle 4$ are complementary.	7. ?

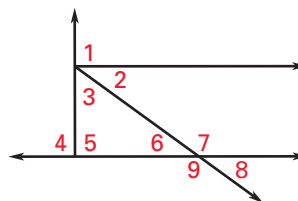
In the diagram, $\angle 1$ is a right angle and $m\angle 6 = 36^\circ$. Copy and complete the statement with $<$, $>$, or $=$.

18. $m\angle 6 + m\angle 7$? $m\angle 4 + m\angle 5$

19. $m\angle 6 + m\angle 8$? $m\angle 2 + m\angle 3$

20. $m\angle 9$? $3(m\angle 6)$

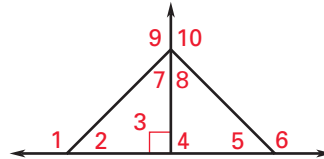
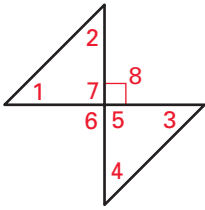
21. $m\angle 2 + m\angle 3$? $m\angle 1$





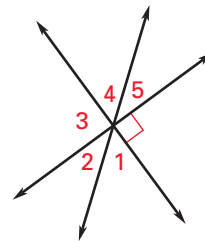
Identify the pair(s) of congruent angles in the figure. Explain how you know they are congruent.

- $\angle 1$ and $\angle 2$ are complementary.
 $\angle 2$ and $\angle 3$ are complementary.
 $\angle 1$ and $\angle 4$ are complementary.
- $\angle 1$ and $\angle 7$ are supplementary.
 $\angle 8$ and $\angle 1$ are supplementary.
 $\angle 5$ and $\angle 1$ are supplementary.



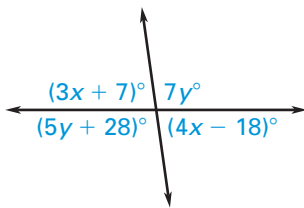
Use the diagram at the right.

- If $m\angle 1 = 53^\circ$, find $m\angle 2$, $m\angle 3$, $m\angle 4$, and $m\angle 5$.
- If $m\angle 2 = 34^\circ$, find $m\angle 1$, $m\angle 3$, $m\angle 4$, and $m\angle 5$.
- If $m\angle 5 = 39^\circ$, find $m\angle 1$, $m\angle 2$, $m\angle 3$, and $m\angle 4$.
- If $m\angle 4 + m\angle 3 = 144^\circ$, find $m\angle 1$, $m\angle 2$, and $m\angle 5$.

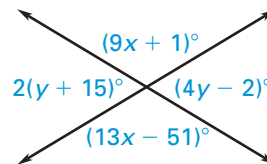


Find the values of the variables.

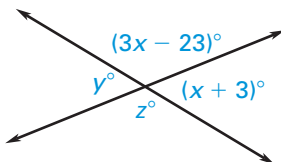
7.



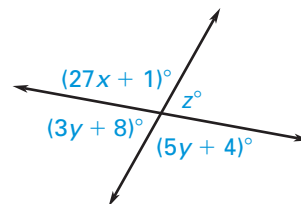
8.



9.

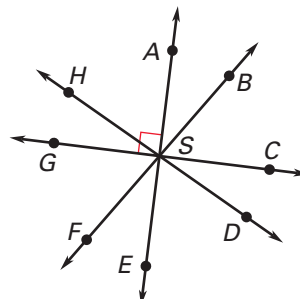


10.



In the diagram, $\overline{AE} \perp \overline{CG}$, $m\angle ASD = 118^\circ$ and $m\angle HSB = 96^\circ$. Find the indicated angle measure.

- Find $m\angle HSE$.
- Find $m\angle FSD$.
- Find $m\angle BSD$.
- Find $m\angle DSE$.
- Find $m\angle CSD$.
- Find $m\angle GSF$.



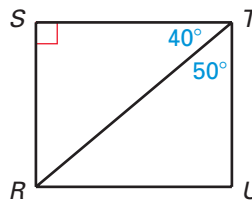
Exercise Set B *(continued)*

Two nonperpendicular lines \overleftrightarrow{TG} and \overleftrightarrow{SF} intersect at B so that B is between T and G , and B is also between S and F . Tell whether the statement is true.

17. $\angle TBF \cong \angle SBG$ 18. $\angle TBF \cong \angle TBS$ 19. $m\angle TBS + m\angle GBF = 180^\circ$
 20. $\angle GBF \cong \angle TBG$ 21. $\angle TBG \cong \angle SBF$ 22. $m\angle TBF + m\angle TBS = 180^\circ$
23. Use the given information and the diagram to complete the proof.

GIVEN: $\angle S$ is a right angle.
 $m\angle RTS = 40^\circ, m\angle RTU = 50^\circ$

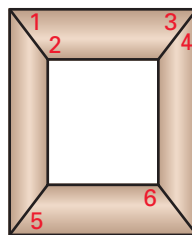
PROVE: $\angle S \cong \angle STU$



Statements	Reasons
1. $\angle S$ is a right angle. $m\angle RTS = 40^\circ, m\angle RTU = 50^\circ$	1. ?
2. $\underline{\quad ? \quad} = m\angle RTS + m\angle RTU$	2. ?
3. $m\angle STU = \underline{\quad ? \quad}$	3. Substitution Property of Equality
4. $m\angle STU = \underline{\quad ? \quad}$	4. Simplify.
5. $\angle STU$ is a right angle.	5. ?
6. $\underline{\quad ? \quad}$	6. Right Angles Congruence Theorem

24. **Picture Frame** You are making the picture frame shown.

GIVEN: $\angle 1$ and $\angle 4$ are complementary.
 $\angle 4$ and $\angle 5$ are complementary.
 $\angle 1$ and $\angle 2$ are supplementary.
 $\angle 5$ and $\angle 6$ are supplementary.
 $m\angle 1 = 52^\circ$



PROVE: $m\angle 6 = 128^\circ$

25. $\angle ABC$ is bisected by \overrightarrow{BD} , and \overrightarrow{BD} and \overrightarrow{BE} are opposite rays. You want to show that $\angle ABE \cong \angle CBE$.
- Draw a diagram.
 - Identify the GIVEN and PROVE statements for the situation.
 - Write a two-column proof.