

Name the property of equality or congruence that justifies going from the first statement to the second statement.

1.  $\overline{XY} \cong \overline{TZ}$   
 $\overline{TZ} \cong \overline{XY}$

2.  $3(x + 2) = 15$   
 $3x + 6 = 15$

3.  $m\angle A = m\angle B$  and  $m\angle B = m\angle C$   
 $m\angle A = m\angle C$

4.  $3x + 2 = 7$   
 $3x = 5$

5.  $AB = 5$  and  $AB + DE = FG$   
 $5 + DE = FG$

Fill in the missing statements or reasons for the two column proofs.

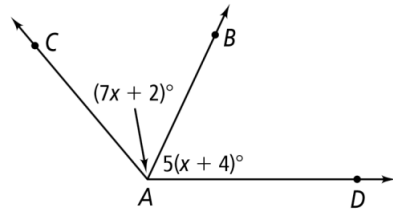
6. Given:  $KM = 35$   
 Prove:  $x = 10$



Statements	Reasons
1) $KM = 35$	1)
2) $KL + LM = KM$	2)
3) $(2x - 5) + 2x = 35$	3)
4) $4x - 5 = 35$	4)
5) $4x = 40$	5)
6) $x = 10$	6)

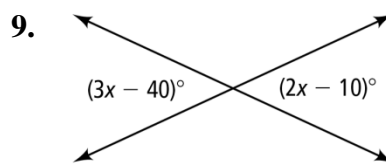
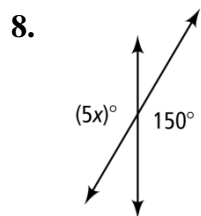
7. **Given:**  $\overrightarrow{AB}$  is the bisector of  $\angle CAD$

**Prove:**  $m\angle CAB = 65$



Statements	Reasons
1) $\overrightarrow{AB}$ is the bisector of $\angle CAD$	1)
2)	2) Definition of Angle Bisector
3) $7x + 2 = 5(x + 4)$	3)
4) $7x + 2 = 5x + 20$	4)
5)	5) Subtraction Property of Equality
6) $2x = 18$	6)
7)	7) Division Property of Equality
8) $m\angle CAB = 7x + 2$	8) Given
9) $m\angle CAB = 7(9) + 2$	9)
10) $m\angle CAB = 65$	10)

Find the value of  $x$ .



Decide whether the angles are *alternate interior angle*, *same-side interior angles*, *corresponding angles*, or *alternate exterior angles*.

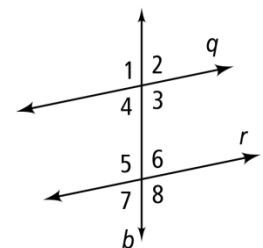
10.  $\angle 2$  and  $\angle 7$

11.  $\angle 5$  and  $\angle 4$

12.  $\angle 8$  and  $\angle 3$

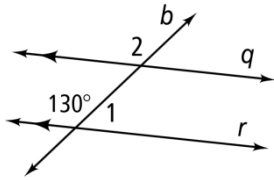
13.  $\angle 6$  and  $\angle 4$

14.  $\angle 1$  and  $\angle 5$

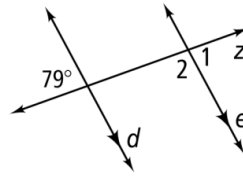


Find  $m\angle 1$  and  $m\angle 2$ .

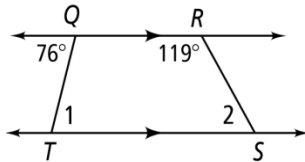
15.



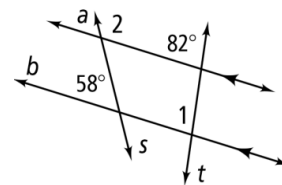
16.



17.

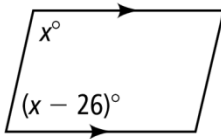


18.

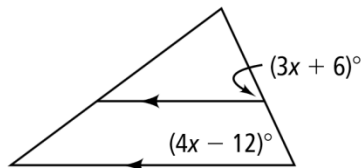


Find the value of  $x$  and  $y$ . Then find the measure of each labeled angle.

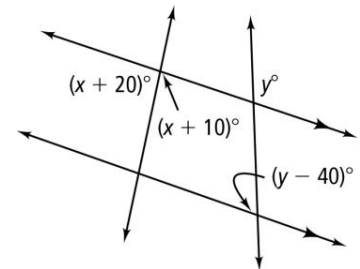
19.



20.



21.

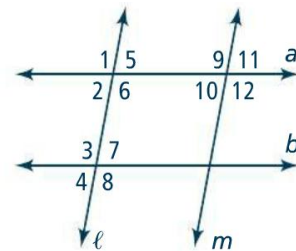


Use the given information to determine which lines are parallel. Justify your answer.

22.  $\angle 1 \cong \angle 3$

23.  $\angle 5 \cong \angle 10$

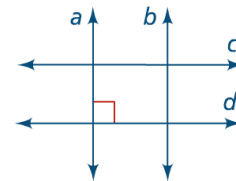
24.  $\angle 2$  is supplementary to  $\angle 3$



Use the diagram at the right to complete each statement.

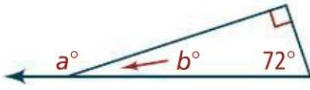
25. If  $b \perp c$  and  $b \perp d$ , then  $c$  \_\_\_\_\_  $d$ .

26. If  $c \parallel d$ , then \_\_\_\_\_  $\perp c$ .

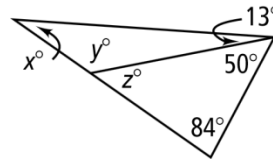


Find the value of each variable.

27.



28.



The measures of three angles of a triangle are given. Find the value of  $x$ .

29.  $x, 2x, 3x$

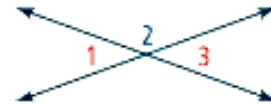
30.  $x + 10, x - 20, x + 25$

Prove the following theorems.

31. Prove the Vertical Angles Theorem: *Vertical angles are congruent.*

**Given:**  $\angle 1$  and  $\angle 3$  are vertical angles

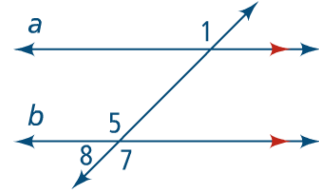
**Prove:**  $\angle 1 \cong \angle 3$



32. Prove the Exterior Angles Theorem: *If a transversal intersects two parallel lines, then alternate exterior angles are congruent.*

**Given:**  $a \parallel b$

**Prove:**  $\angle 1 \cong \angle 7$

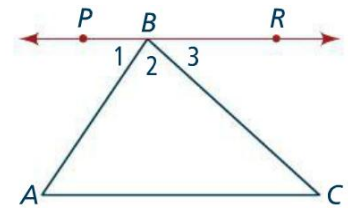


33. Prove the Triangle Angle-Sum Theorem: *The sum of the measures of a triangle is 180.*

**Given:**  $\triangle ABC$

**Prove:**  $m\angle A + m\angle 2 + m\angle C = 180$

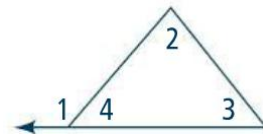
(Begin by drawing auxiliary line  $\overleftrightarrow{PR}$  through  $B$ , parallel to  $\overleftrightarrow{AC}$ .)



34. Prove the Triangle Exterior Angle Theorem: *The measure of each exterior angle of a triangle equals the sum of the measures of its two remote interior angles.*

**Given:**  $\angle 1$  is an exterior angle of the triangle

**Prove:**  $m\angle 1 = m\angle 2 + m\angle 3$



**Math 2 Honors**  
**Chapter 6 Review Answers**

1. Symmetric POC
2. Distributive Property
3. Transitive POE
4. Subtraction POE
5. Substitution POE
6. 1) Given
  - 2) Segment Addition Postulate
  - 3) Substitution POE
  - 4) Combine Like Terms
  - 5) Addition POE
  - 6) Division POE
7. 1) Given
  - 2)  $m\angle CAB = m\angle BAD$
  - 3) Substitution POE
  - 4) Distributive Property
  - 5)  $2x + 2 = 20$
  - 6) Subtraction POE
  - 7)  $x = 9$
  - 9) Substitution POE
  - 10) Simplify
8.  $x = 30$
9.  $x = 30$
10. alternate exterior
11. same side interior
12. corresponding
13. alternate interior
14. corresponding
15.  $m\angle 1 = 50^\circ$ ,  $m\angle 2 = 130^\circ$
16.  $m\angle 1 = 79^\circ$ ,  $m\angle 2 = 101^\circ$
17.  $m\angle 1 = 76^\circ$ ,  $m\angle 2 = 61^\circ$
18.  $m\angle 1 = 82^\circ$ ,  $m\angle 2 = 122^\circ$
19.  $x = 103$ ;  $103^\circ$ ;  $77^\circ$
20.  $x = 18$ ;  $60^\circ$ ;  $60^\circ$
21.  $x = 75$ ;  $y = 110$ ;  $95^\circ$ ;  $105^\circ$ ;  $110^\circ$ ;  $70^\circ$
22.  $a \parallel b$ ; Converse of Corresponding  $\angle$ s Theorem
23.  $l \parallel m$ ; Converse of Alt. Int.  $\angle$ s Theorem
24.  $a \parallel b$ ; Converse of Same Side Int.  $\angle$ s Theorem
25.  $\parallel$
26.  $a$
27.  $a = 162$ ;  $b = 18$
28.  $x = 33$ ;  $y = 134$ ;  $z = 46$
29.  $x = 30$
30.  $x = 55$
31. 1)  $\angle 1$  and  $\angle 3$  are vert.  $\angle$ s 1) Given
  - 2)  $m\angle 1 + m\angle 2 = 180$ ,  $m\angle 2 + m\angle 3 = 180$
  - 2) Linear  $\angle$ s are Supplementary
  - 3)  $m\angle 1 + m\angle 2 = m\angle 2 + m\angle 3$  3) Transitive POE
  - 4)  $m\angle 1 = m\angle 3$  4) Subtraction POE
  - 5)  $\angle 1 \cong \angle 3$  5) Def. of Congruence
32. 1)  $a \parallel b$  1) Given
  - 2)  $\angle 5 \cong \angle 7$  2) Vert.  $\angle$ s are  $\cong$
  - 3)  $\angle 1 \cong \angle 5$  3) Corresponding  $\angle$ s are  $\cong$
  - 4)  $\angle 1 \cong \angle 7$  4) Transitive POC
33. 1)  $m\angle A = m\angle 1$  1) Alt. Int.  $\angle$ s Th.
  - 2)  $m\angle C = m\angle 3$  2) Alt. Int.  $\angle$ s Th.
  - 3)  $m\angle 1 + m\angle 2 + m\angle 3 = 180$  3) Linear  $\angle$ s
  - 4)  $m\angle A + m\angle 2 + m\angle C = 180$  4) Substitution
34. 1)  $\angle 1$  is an exterior angle 1) Given
  - 2)  $m\angle 2 + m\angle 3 + m\angle 4 = 180$
  - 2) Triangle Angle-Sum Th.
  - 3)  $m\angle 1 + m\angle 4 = 180$
  - 3) Linear  $\angle$ s are Supplementary
  - 4)  $m\angle 1 + m\angle 4 = m\angle 2 + m\angle 3 + m\angle 4$
  - 4) Transitive POC
  - 5)  $m\angle 1 = m\angle 2 + m\angle 3$  5) Subtraction POE



