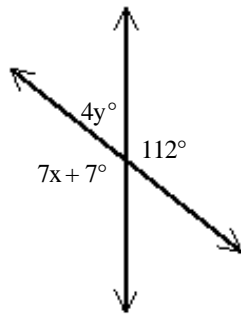


3.1-3.5 Study Guide

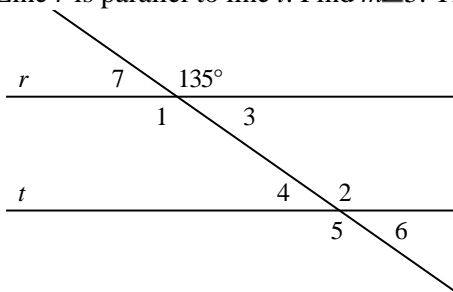
Short Answer

- \overline{BD} bisects $\angle ABC$. $m\angle ABC = 7x$. $m\angle ABD = \underline{3x + 25}$. Find $m\angle DBC$.
- Find the values of x and y .

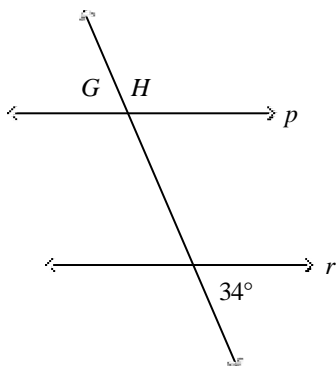


Drawing not to scale

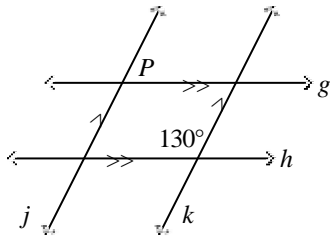
- Line r is parallel to line t . Find $m\angle 5$. The diagram is not to scale.



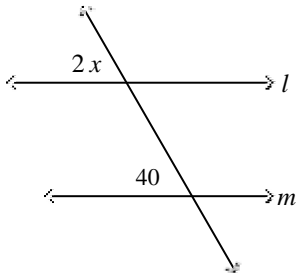
- Find $m\angle G$. The diagram is not to scale.



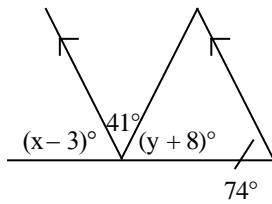
5. Find $m\angle P$. The diagram is not to scale.



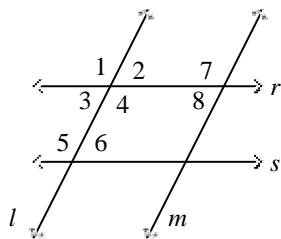
6. Find the value of x . The diagram is not to scale.



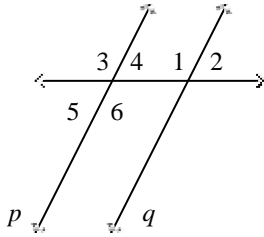
7. Find the values of x and y . The diagram is not to scale.



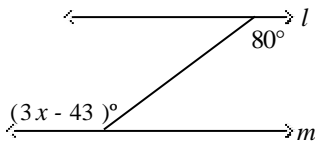
8. Which lines are parallel if $m\angle 3 = m\angle 6$? Justify your answer.



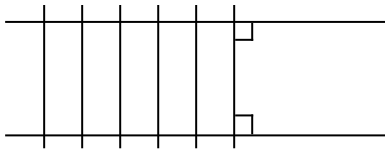
9. Find the value of x for which p is parallel to q , if $m\angle 1 = 4x$ and $m\angle 3 = 112$. The diagram is not to scale.



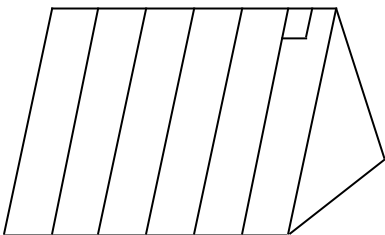
10. Find the value of x for which l is parallel to m . The diagram is not to scale.



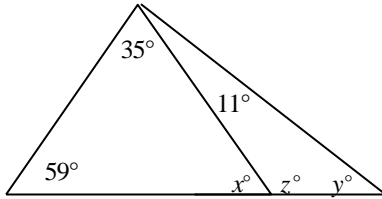
11. Each tie on the railroad tracks is perpendicular to both of the tracks. What is the relationship between the two tracks? Justify your answer.



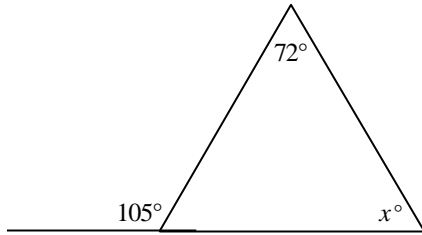
12. Each sheet of metal on a roof is parallel to the rest of the sheets of metal. If the first sheet of metal is perpendicular to the top line of the roof, what can you conclude about the rest of sheets of metal? Justify your answer.



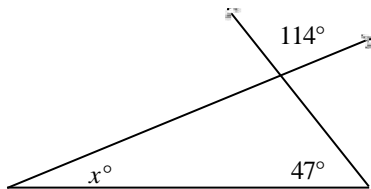
13. Find the values of x , y , and z . The diagram is not to scale.



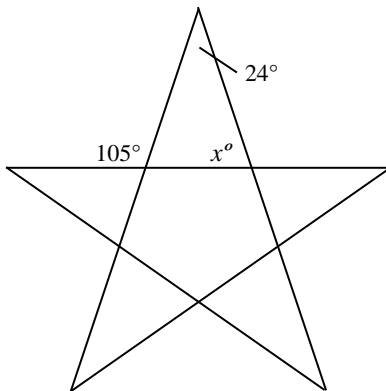
14. Find the value of x . The diagram is not to scale.



15. Find the value of x . The diagram is not to scale.

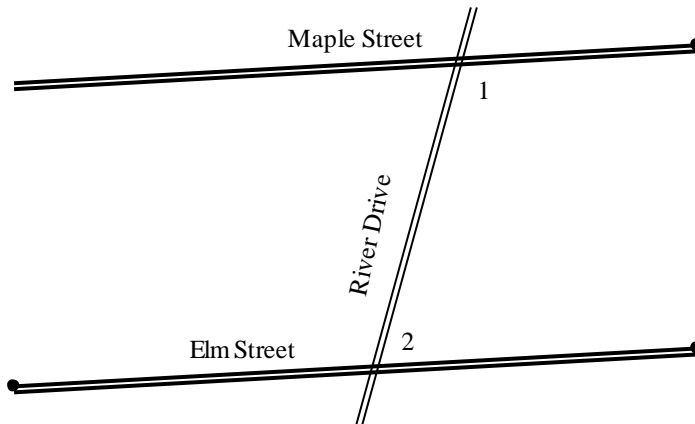


16. A triangular playground has angles with measures in the ratio $8 : 3 : 9$. What is the measure of the smallest angle?
17. A star patterned quilt has a star with the angles shown. What is the value of x ? The diagram is not to scale.



18. The 8 rowers in the racing boat stroke so that the angles formed by their oars with the side of the boat all stay equal. Explain why their oars on either side of the boat remain parallel.

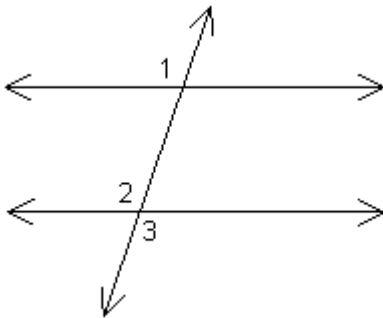
19. The map given shows the relationship between three streets. Suppose that $m\angle 1 + m\angle 2 = 180^\circ$. Are Maple Street and Elm Street parallel? Explain.



20. Complete the two-column proof.

Given: $\angle 1 \cong \angle 2$, $m\angle 1 = 130$

Prove: $m\angle 3 = 130$



Drawing not to scale

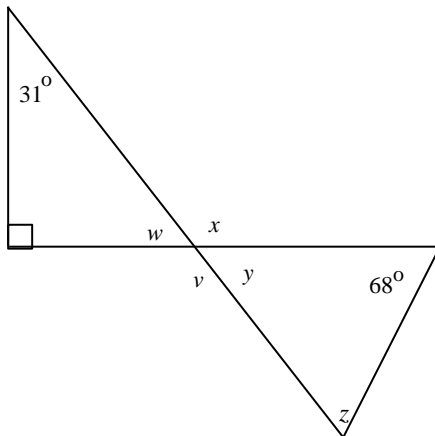
$\angle 1 \cong \angle 2$, $m\angle 1 = 130$ a. _____

$m\angle 2 = 130$ b. _____

$m\angle 2 = m\angle 3$ c. _____

$m\angle 3 = 130$ d. _____

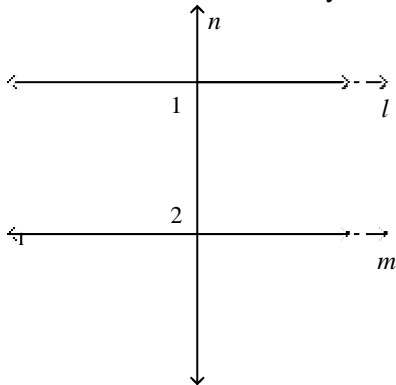
21. Find the values of the variables. Show your work and explain your steps. The diagram is not to scale.



22. **a.** Write the following conditional in if-then form.
b. Write its converse, inverse, and contrapositive in if-then form.
c. Determine the truth value of the original conditional, converse, inverse, and contrapositive. Explain why each of them is true or false, and provide a counterexample(s) for any false statement(s).

On a number line, the points with coordinates -2 and 5 are seven units apart.

23. Given $m\angle 1 = m\angle 2$, what can you conclude about the lines l , m , and n ? Explain.



3.1-3.5 Study Guide Answer Section

SHORT ANSWER

1. 175
2. $x = 15, y = 17$
3. 135
4. 34°
5. 50°
6. 20
7. $x = 77, y = 57$
8. $r \parallel s$, by the Converse of the Alternate Interior Angles Theorem
9. 28
10. 41
11. The two tracks are parallel by the Perpendicular Transversal Theorem.
12. The sheets of metal are all perpendicular to the top line of the roof by the Perpendicular Transversal Theorem.
13. $x = 86, y = 75, z = 94$
14. 33
15. 19
16. 27
17. 81
18. The rowers keep corresponding angles congruent.
19. Yes, Maple Street and Elm Street are parallel where River Drive crosses them. $\angle 1$ and $\angle 2$ are same-side interior angles. If two lines and a transversal form same-side interior angles that are supplementary, then the two lines are parallel (Converse of the Same-Side Interior Angles Theorem).

20.
 - [4] **a.** Given
 - b.** Substitution Property
 - c.** Vertical Angles Theorem
 - d.** Substitution Property
- [3] three parts correct
- [2] two parts correct
- [1] one part correct

21.
 - [4] $w + 31 + 90 = 180$, so $w = 59^\circ$. Because vertical angles are congruent, $y = 59^\circ$.
Because supplementary angles have measures with sum 180, $x = v = 121^\circ$.
 $z + 68 + y = z + 68 + 59 = 180$, so $z = 53^\circ$.
 - [3] small error leading to one incorrect answer
 - [2] three correct answers, work shown
 - [1] two correct answers, work shown

22. **a.** On a number line, if points have coordinates -2 and 5 , then they are seven units apart.
- b.** Converse: On a number line, if points are seven units apart, then they have coordinates -2 and 5 .
 Inverse: On a numberline, if the points do not have coordinates -2 and 5 , then they are not seven units apart.
 Contrapositive: On a number line if the points are not seven units apart, then they are not coordinates -2 and 5 .
- c.** Conditional: is true by the Ruler Postulate.
 Converse: is false. The points 0 and 7 are seven units apart, but their coordinates are not -2 and 5 .
 Inverse: is false, lots of points will be 7 units apart, 1 and 8
 Contrapositive: is true Ruler Postulate
23. l and m are both perpendicular to n . Explanation: Because l and m are parallel, $\angle 1$ and $\angle 2$ are supplementary by the Same-Side Interior Angles Theorem. It is given that $m\angle 1 = m\angle 2$, so $180 = m\angle 1 + m\angle 2 = m\angle 1 + m\angle 1 = 2m\angle 1$, and $m\angle 1 = 90 = m\angle 2$. Because $\angle 1$ and $\angle 2$ are right angles, l is perpendicular to n and m is perpendicular to n .