3 Lesson Practice Level B

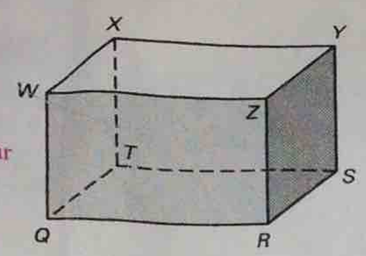
LESSON 3.1

Practice B

For use with pages 146–152

Think of each segment in the diagram as part of a line. Complete the statement with *parallel, skew,* or *perpendicular.*

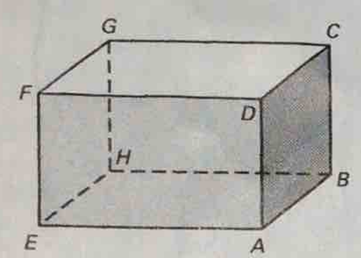
1. $\overleftrightarrow{WZ}$ and $\overleftrightarrow{ZR}$ are ___?___. perpendicular
2. $\overleftrightarrow{WZ}$ and $\overleftrightarrow{ST}$ are ___?___. parallel
3. $\overleftrightarrow{QT}$ and $\overleftrightarrow{YS}$ are ___?___. skew
4. Plane WZR and plane SYZ are ___?___. perpendicular
5. Plane RQT and plane YXW are ___?___. parallel



Think of each segment in the diagram as part of a line. Which line(s) or plane(s) appear to fit the description?

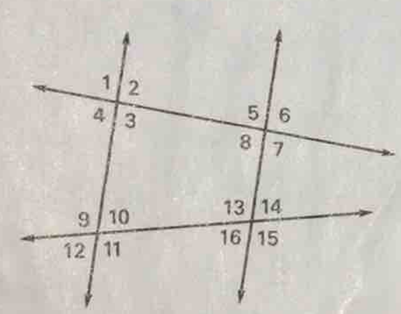
6. Line(s) parallel to $\overleftrightarrow{EH}$ $\overleftrightarrow{FG}, \overleftrightarrow{DC}, \overleftrightarrow{AB}$
7. Line(s) perpendicular to $\overleftrightarrow{EH}$ $\overleftrightarrow{AE}, \overleftrightarrow{BH}, \overleftrightarrow{EF}, \overleftrightarrow{HG}$
8. Line(s) skew to $\overleftrightarrow{CD}$ and containing point F $\overleftrightarrow{EF}$
9. Plane(s) perpendicular to plane AEH
10. Plane(s) parallel to plane FGC plane EHB

9. plane EFG, ABC, ADF, and BCG



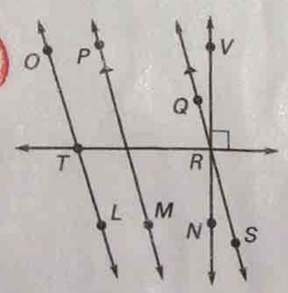
Classify the angle pair as *corresponding, alternate interior, alternate exterior,* or *consecutive interior* angles.

11. $\angle 1$ and $\angle 9$ corresponding
12. $\angle 8$ and $\angle 13$ consecutive interior
13. $\angle 6$ and $\angle 16$ alternate exterior
14. $\angle 4$ and $\angle 10$ alternate interior
15. $\angle 8$ and $\angle 16$ corresponding
16. $\angle 10$ and $\angle 13$ consecutive interior



In Exercises 17–20, use the markings in the diagram.

17. Name a pair of parallel lines. $\overleftrightarrow{PM} \parallel \overleftrightarrow{QS}$ (not $\overleftrightarrow{OL}$)
18. Name a pair of perpendicular lines. $\overleftrightarrow{VN} \perp \overleftrightarrow{RT}$
19. Is $\overleftrightarrow{OL} \parallel \overleftrightarrow{TR}$? *Explain.* No; the lines intersect at T.
20. Is $\overleftrightarrow{OL} \perp \overleftrightarrow{TR}$? *Explain.* No; there is no right angle symbol shown.



LESSON 3.1

LESSON 3.1

Practice B *continued*

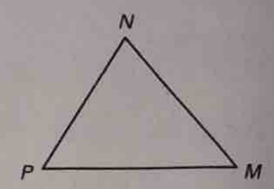
For use with pages 146–152

Copy and complete the statement with *sometimes, always,* or *never.*

21. If two lines are parallel, then they ___?___ intersect. never
22. If one line is skew to another, then they are ___?___ coplanar. never
23. If two lines intersect, then they are ___?___ perpendicular. sometimes
24. If two lines are coplanar, then they are ___?___ parallel. sometimes

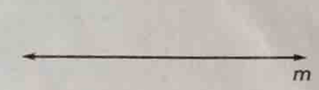
Copy the diagram and sketch the line. See below.

25. Line through M and parallel to $\overleftrightarrow{NP}$.
26. Line through N and perpendicular to $\overleftrightarrow{MP}$.
27. Line through M and perpendicular to $\overleftrightarrow{MP}$.
28. Line through P and parallel to $\overleftrightarrow{MN}$.

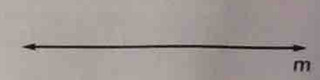


Use construction tools to construct a line through point *P* that is parallel to line *m*. **29–30.** Check students' drawings.

29.

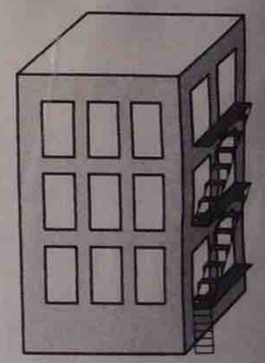


30.

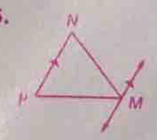


Use the diagram of the fire escape to decide whether the statement is *true* or *false*.

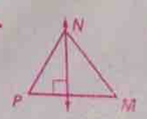
31. The planes containing the platforms outside of each pair of windows are parallel to the ground. true
32. The planes containing the stairs are parallel to each other. true
33. The planes containing the platforms outside of each pair of windows are perpendicular to the planes containing the stairs. false
34. The planes containing the platform outside of each pair of windows are perpendicular to the plane containing the side of the building. true



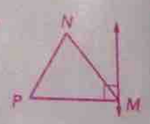
25.



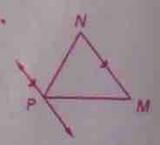
26.



27.



28.



LESSON 3.2

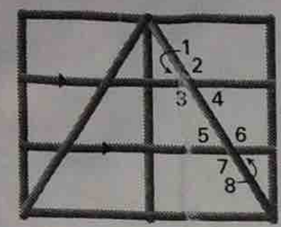
Practice B

For use with pages 153–160

1. 50°; Corresponding Angles Postulate
2. 135°; Consecutive Interior Angles Theorem

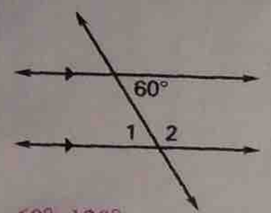
Find the angle measure. Tell which postulate or theorem you use.

1. If $m\angle 1 = 50°$, then $m\angle 5 =$ ___?___.
2. If $m\angle 4 = 45°$, then $m\angle 6 =$ ___?___.
3. If $m\angle 2 = 130°$, then $m\angle 7 =$ ___?___.
4. If $m\angle 6 = 123°$, then $m\angle 3 =$ ___?___.

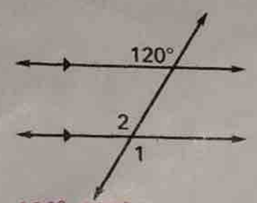


3. 130°; Alternate Exterior Angles Theorem
4. 123°; Alternate Interior Angles Theorem

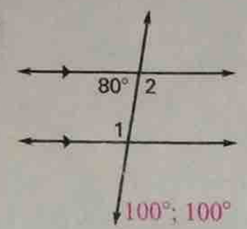
Find $m\angle 1$ and $m\angle 2$.

5.


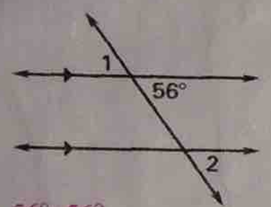
60°; 120°

6.


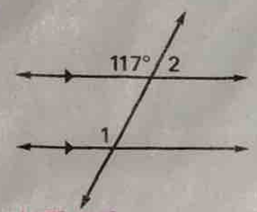
120°; 120°

7.


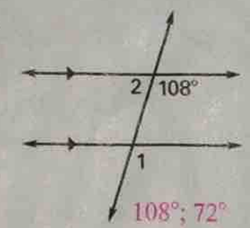
100°; 100°

8.


56°; 56°

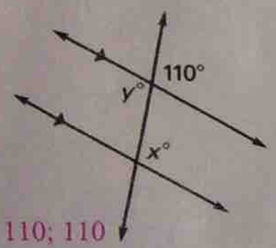
9.


117°; 63°

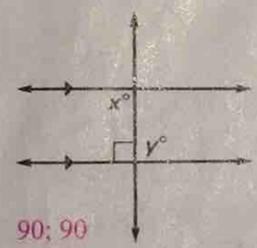
10.


108°; 72°

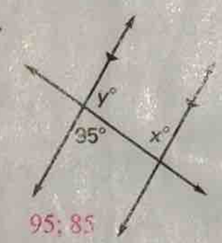
Find the values of x and y.

11.


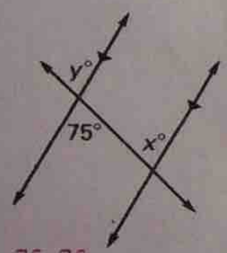
110; 110

12.


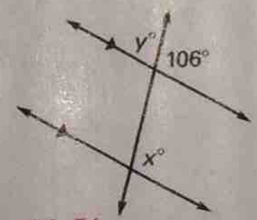
90; 90

13.


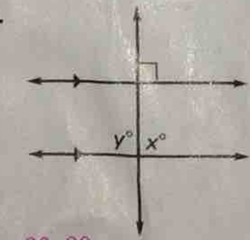
95; 85

14.


75; 75

15.


106; 74

16.


90; 90

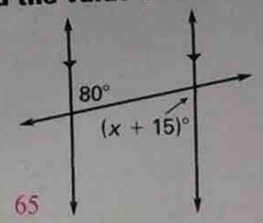
LESSON 3.2

LESSON 3.2

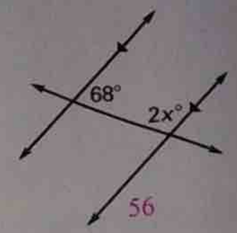
Practice B *continued*

For use with pages 153–160

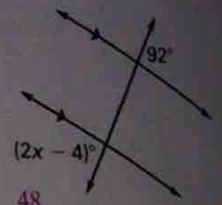
Find the value of x.

17.


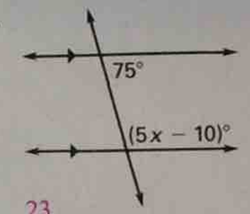
65

18.


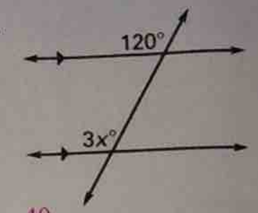
56

19.


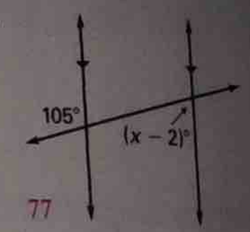
48

20.


23

21.


40

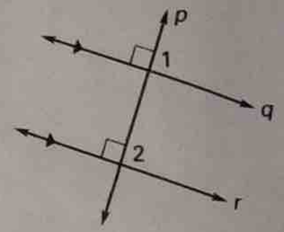
22.


77

In Exercises 23–31, complete the two-column proof.

GIVEN: $p \perp q$, $q \parallel r$

PROVE: $p \perp r$



Statements	Reasons	
$p \perp q$	23. ___?___	Given
$\angle 1$ is a right angle	24. ___?___	Perpendicular lines form right angles
$m\angle 1 = 90°$	25. ___?___	Definition of right angle
$q \parallel r$	26. ___?___	Given
$\angle 1 \cong \angle 2$	27. ___?___	Corresponding Angles Postulate
$m\angle 1 = m\angle 2$	28. ___?___	Definition of congruent angles
$m\angle 2 = 90°$	29. ___?___	Substitution Property of Equality
$\angle 2$ is a right angle	30. ___?___	Definition of right angle
$p \perp r$	31. ___?___	Perpendicular lines form right angles

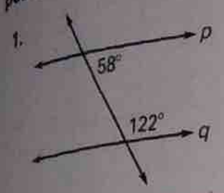
LESSON 3.3

Practice B

For use with pages 161–169

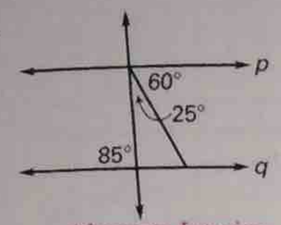
Is it possible to prove that lines p and q are parallel? If so, state the postulate or theorem you would use.

1.



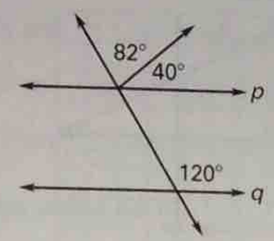
yes; Consecutive Interior Angles Converse

2.



yes; Alternate Interior Angles Converse

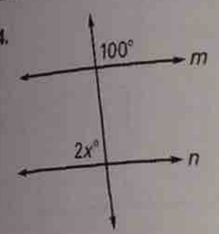
3.



no

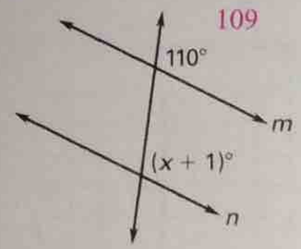
Find the value of x that makes $m \parallel n$.

4.



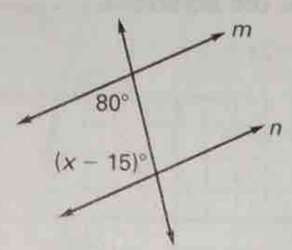
40

5.



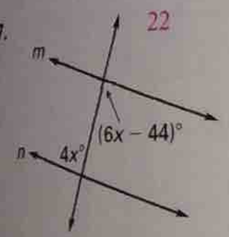
109

6.



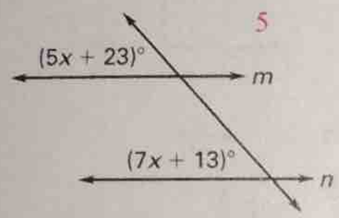
115

7.



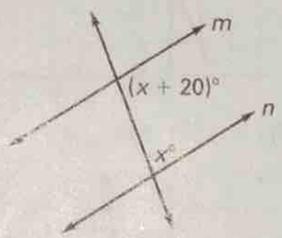
22

8.



5

9.



80

In Exercises 10–12, choose the word that best completes the statement.

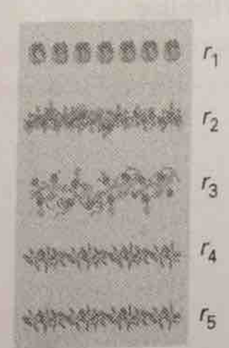
10. If two lines are cut by a transversal so the alternate interior angles are (*congruent, supplementary, complementary*), then the lines are parallel. congruent

11. If two lines are cut by a transversal so the consecutive interior angles are (*congruent, supplementary, complementary*), then the lines are parallel. supplementary

12. If two lines are cut by a transversal so the corresponding angles are (*congruent, supplementary, complementary*), then the lines are parallel. congruent

13. **Gardens** A garden has five rows of vegetables. Each row is parallel to the row immediately next to it. *Explain* why the first row is parallel to the last row.

Each row is parallel to the one next to it, so $r_1 \parallel r_2$, $r_2 \parallel r_3$, and so on. Then $r_1 \parallel r_3$ by the Transitive Property of Parallel Lines. By continuing this reasoning, $r_1 \parallel r_5$. So, the first row is parallel to the last row.



LESSON 3.3

LESSON 3.3

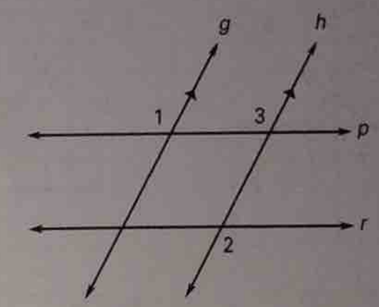
Practice B *continued*

For use with pages 161–169

In Exercises 14–18, complete the two-column proof.

GIVEN: $g \parallel h$, $\angle 1 \cong \angle 2$

PROVE: $p \parallel r$

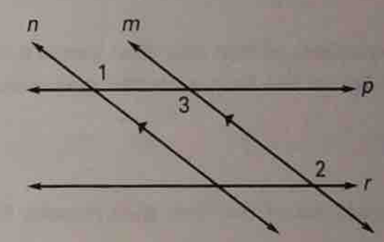


Statements	Reasons	
$g \parallel h$	14. ?	Given
$\angle 1 \cong \angle 3$	15. ?	Corresponding Angles Postulate
$\angle 1 \cong \angle 2$	16. ?	Given
$\angle 2 \cong \angle 3$	17. ?	Transitive Property of Equality
$p \parallel r$	18. ?	Alternate Exterior Angles Converse

In Exercises 19–23, complete the two-column proof.

GIVEN: $n \parallel m$, $\angle 1 \cong \angle 2$

PROVE: $p \parallel r$



Statements	Reasons	
$n \parallel m$	19. ?	Given
$\angle 1 \cong \angle 3$	20. ?	Alternate Interior Angles Theorem
$\angle 1 \cong \angle 2$	21. ?	Given
$\angle 2 \cong \angle 3$	22. ?	Transitive Property of Equality
$p \parallel r$	23. ?	Alternate Interior Angles Converse

24. **Railroad Tracks** Two sets of railroad tracks intersect as shown. How do you know that line n is parallel to line m?

Corresponding Angles Converse