Name _____ Date _____

LESSON 2.4

LESSON 2.4

Practice B

For use with pages 98–104

Draw a sketch to illustrate each postulate.

1. If two lines intersect, then their intersection is exactly one point.

2. If two points lie in a plane, then the line containing them lies in the plane.

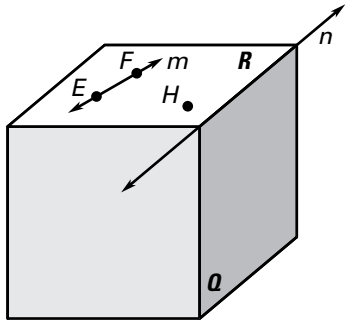
3. If two planes intersect, then their intersection is a line.

Use the diagram to state and write out the postulate that verifies the truth of the statement.

4. The points E, F, and H lie in a plane (labeled R).

5. The points E and F lie on a line (labeled m).

6. The planes Q and R intersect in a line (labeled n).



7. The points E and F lie in a plane R. Therefore, line m lies in plane R.

In Exercises 8–11, think of the intersection of the ceiling and the front wall of your classroom as line *k*. Think of the center of the floor as point *A* and the center of the ceiling as point *B*.

8. Is there more than one line that contains both points A and B?

9. Is there more than one plane that contains both points A and B?

10. Is there a plane that contains line k and point A?

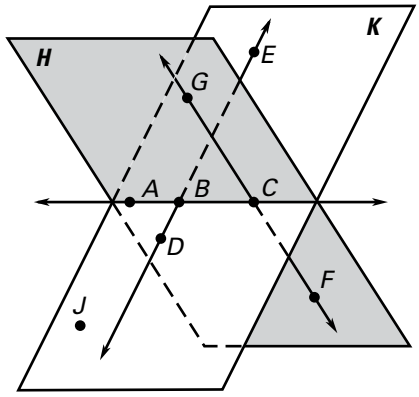
11. Is there a plane that contains points A, B, and a point on the front wall?

LESSON 2.4

Practice B *continued*

For use with pages 98–104

In Exercises 12–19, use the diagram to determine if the statement is *true* or *false*.



12. Points A, B, D, and J are coplanar.

13. $\angle EBA$ is a right angle.

14. Points E, G, and A are collinear.

15. $\overleftrightarrow{FG} \perp$ plane H

16. $\angle ABD$ and $\angle EBC$ are vertical angles.

17. Planes H and K intersect at $\overleftrightarrow{AB}$.

18. $\overleftrightarrow{FG}$ and $\overleftrightarrow{DE}$ intersect.

19. $\angle GCA$ and $\angle CBD$ are congruent angles.

20. **Neighborhood Map** A friend e-mailed you the following statements about a neighborhood. Use the statements to complete parts (a)–(e).

Building B is due south of Building A.

Buildings A and B are on Street 1.

Building C is due east of Building B.

Buildings B and C are on Street 2.

Building D is southeast of Building B.

Buildings B and D are on Street 3.

Building E is due west of Building C.

$\angle DBE$ formed by Streets 2 and 3 is acute.

a. Draw a diagram of the neighborhood.

b. Where do Streets 1 and 2 intersect?

c. Classify the angle formed by Streets 1 and 2.

d. What street is building E on?

e. Is building E between buildings B and C? *Explain*.

6.

Converse		
p	q	$q \to p$
T	F	T

Inverse		
$\sim p$	$\sim q$	$\sim p \to \sim q$
F	T	T

Contrapositive		
$\sim q$	$\sim p$	$\sim q \to \sim p$
T	F	F

7.

Converse		
p	q	$q \to p$
F	F	T

Inverse		
$\sim p$	$\sim q$	$\sim p \to \sim q$
T	T	T

Contrapositive		
$\sim q$	$\sim p$	$\sim q \to \sim p$
T	T	T

Lesson 2.4

Practice Level A

1. Postulate 5 **2.** Postulate 8 **3.** Postulate 9

4. Postulate 6 **5.** Postulate 6 **6.** Postulate 10

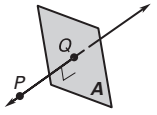
7. Postulate 8 **8.** Postulate 9 **9.** Through the two points A and B, there exists exactly the one line, q. **10.** Line q contains at least the two points A and B. **11.** Lines p and q intersect in exactly the one point A. **12.** Through the three noncollinear points C, D, and E, there exists only the one plane S. **13.** Plane S contains at least the three noncollinear points C, D, and E.

14. *Sample answer:* The two points D and E lie in plane R, so the line m that contains them lies in R.

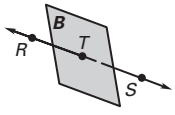
15. The intersection of planes R and S is line m.

16. no **17.** no **18.** yes **19.** no

20. *Sample answer:*



21. *Sample answer:*



22. yes; directly indicated by right angle symbol

23. yes; $\overleftrightarrow{EF} \perp$ plane S, so it is $\perp$ to every line in S that it intersects **24.** no; can't assume collinearity without the line drawn

25. yes; all 3 points are on one line

26. yes; it is obvious in diagram

27. no; can't assume that $\overleftrightarrow{DH}$ intersects $\overleftrightarrow{EF}$

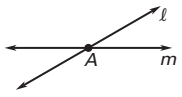
28. yes; $\overleftrightarrow{EF} \perp$ to every line in plane S that it intersects **29.** no; can't assume these lines $\perp$ without a rt. angle marked

30. a. The pole is perpendicular to the ground. **b.** yes **c.** The corresponding segments are marked $\cong$, so the distances are all 6 ft. **d.** yes; because the pole is perpendicular to the ground, it is perpendicular to each line passing through point P.

Practice Level B

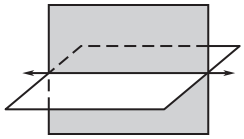
1–3. Sample sketches are given.

1.



2.

3.



4. Postulate 8: Through any three noncollinear points there exists exactly one plane.

5. Postulate 5: Through any two points there exists exactly one line. **6.** Postulate 11: If two planes intersect, then their intersection is a line.

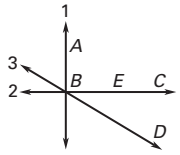
7. Postulate 10: If two points lie in a plane, then the line containing them lies in the plane.

8. No. Through any two points there exists exactly one line. **9.** Yes. Points A and B could lie on the line intersecting two planes.

10. Yes. Take point A and any two points on line k and you can form a plane through those three points that contains all of line k. **11.** Yes. The plane that runs from the front of the room to the back of the room through points A and B contains both points and a point on the front wall.

12. true **13.** false **14.** false **15.** false **16.** true **17.** true **18.** false **19.** false

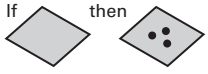
20. a.



b. building B **c.** right **d.** 2 **e.** Yes, because $\angle DBE$ is acute and Building E is due west of Building C.

Practice Level C

1. If then



2. If then