LT 1.1 Parallel Lines and Transversal

Homework: Complete #21-37 odd

Honors: Complete #25-37 odd, #46-49 all

Practice and Problem Solving

Extra Practice is on page R3.

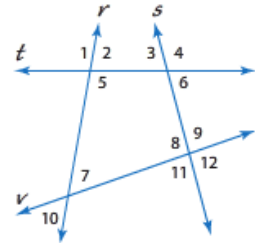**Example 1**

Refer to the figure to identify each of the following.

13. all segments parallel to $\overline{DM}$ **CL, EN, BK, AJ**

14. a plane parallel to plane ACD **JLM**

15 a segment skew to $\overline{BC}$ **EN, AJ, DM, NM, NJ, JK or ML**

16. all planes intersecting plane EDM **DCL, NML, AED, AEN**

17. all segments skew to $\overline{AE}$ **KL, CL, BK, ML, DM, NM, KJ**

18. a segment parallel to $\overline{EN}$ **AJ, BK, CL, or DM**

19. a segment parallel to $\overline{AB}$ through point J **JK**

20. a segment skew to $\overline{CL}$ through point E **AE, ED**
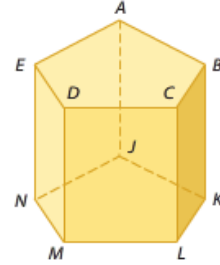
Examples 2–3 **CCSS** **PRECISION** Identify the transversal connecting each pair of angles. Then classify the relationship between each pair of angles as *alternate interior, alternate exterior, corresponding,* or *consecutive interior* angles.

21–30. See margin.

21. $\angle 4$ and $\angle 9$ **22.** $\angle 5$ and $\angle 7$

23. $\angle 3$ and $\angle 5$ **24.** $\angle 10$ and $\angle 11$

25. $\angle 1$ and $\angle 6$ **26.** $\angle 6$ and $\angle 8$

27. $\angle 2$ and $\angle 3$ **28.** $\angle 9$ and $\angle 10$

29. $\angle 4$ and $\angle 11$ **30.** $\angle 7$ and $\angle 11$

Example 3

SAFETY Identify the transversal connecting each pair of angles in the photo of a fire escape shown. Then classify the relationship between each pair of angles. **31–36. See margin.**

31. $\angle 1$ and $\angle 2$ **32.** $\angle 2$ and $\angle 4$

33. $\angle 4$ and $\angle 5$ **34.** $\angle 6$ and $\angle 7$

35. $\angle 7$ and $\angle 8$ **36.** $\angle 2$ and $\angle 3$

37. POWER Power lines are not allowed to intersect.

   a. What must be the relationship between power lines p and m? Explain your reasoning. **See margin.**

   b. What is the relationship between line q and lines p and m? **Line q is a transversal of lines p and m.**

"See Margin" Answers

46. **OPEN ENDED** Plane *P* contains lines *a* and *b*. Line *c* intersects plane *P* at point *J*. Lines *a* and *b* are parallel, lines *a* and *c* are skew, and lines *b* and *c* are not skew. Draw a figure based upon this description. **See Ch. 3 Answer Appendix.**

47. **CHALLENGE** Suppose points *A*, *B*, and *C* lie in plane *P*, and points *D*, *E*, and *F* lie in plane *Q*. Line *m* contains points *D* and *F* and does not intersect plane *P*. Line *n* contains points *A* and *E*. **a. See Ch. 3 Answer Appendix.**

   a. Draw a diagram to represent the situation.

   b. What is the relationship between planes *P* and *Q*? **parallel**

   c. What is the relationship between lines *m* and *n*? **skew**

48. Sometimes; $\overleftrightarrow{AB}$ is either skew or parallel to $\overleftrightarrow{CD}$ because the lines will never intersect and are not coplanar.

REASONING Plane *X* and plane *Y* are parallel and plane *Z* intersects plane *X*. Line $\overleftrightarrow{AB}$ is in plane *X*, line $\overleftrightarrow{CD}$ is in plane *Y*, and line $\overleftrightarrow{EF}$ is in plane *Z*. Determine whether each statement is *always*, *sometimes*, or *never* true. Explain.

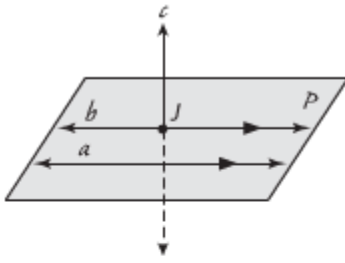48. $\overleftrightarrow{AB}$ is skew to $\overleftrightarrow{CD}$.

49. $\overleftrightarrow{AB}$ intersects $\overleftrightarrow{EF}$.

49. Sometimes; $\overleftrightarrow{AB}$ intersects $\overleftrightarrow{EF}$ depending on where the planes intersect.

50. **WRITING IN MATH** Can a pair of planes be described as skew? Explain. **See Ch. 3 Answer Appendix.**

46.

47a.