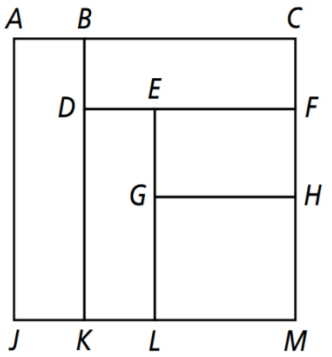
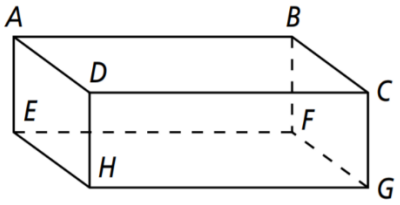
FORMATIVE 2-4

1. Suppose you are laying tiles. You place several different rectangles together to form a larger rectangle.
   a. $\overline{BC}$ is parallel to $\overline{DF}$, $\overline{DF}$ is parallel to $\overline{GH}$. What is the relationship between $\overline{BC}$ and $\overline{GH}$? Explain.

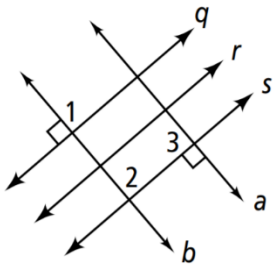


   b. $\overline{BK}$ is parallel to $\overline{EL}$. $\overline{GH}$ is perpendicular to $\overline{BK}$. What is the relationship between $\overline{GH}$ and $\overline{EL}$?



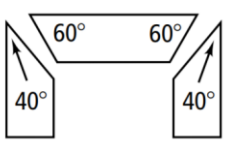
2. **Error Analysis** A student says that according to Theorem 3-9, $\overleftrightarrow{AB}$ and $\overleftrightarrow{BC}$ must be parallel because they are both perpendicular to $\overleftrightarrow{BF}$. Explain the student's error.

3. **Given:** $q \parallel r$, $r \parallel s$, $b \perp q$, and $a \perp s$
   Prove: $a \parallel b$



4. **Open-Ended** Draw a diagram that meets the criteria listed below. Then describe how all the lines are related to each other.
   a. $q \parallel r$
   b. $r \perp s$
   c. $t \parallel q$
   d. $u \perp t$

5. A puppeteer cuts the pieces shown at the right to frame the stage of a puppet theater. Will the sides of the pieces on the left and right be parallel?

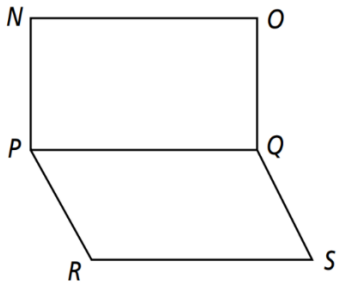


In Exercises 6 and 7, *a*, *b*, *c*, and *d* are distinct lines in the same plane. For each combination of relationships, tell how *a* and *c* relate. Justify your answer.

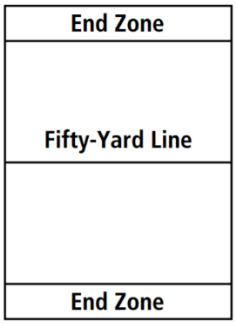
6. $a \perp b; b \perp c$

7. $a \perp b; b \parallel c$

8. Given: $\overleftrightarrow{NP} \perp \overleftrightarrow{NO}; \overleftrightarrow{NP} \perp \overleftrightarrow{PQ}$
$\angle PQS$ and $\angle QSR$ are supplementary.
Prove: $\overleftrightarrow{NO} \parallel \overleftrightarrow{RS}$



9. The recreation department is setting up the football field. They check to make sure that the 50-yd line and the end zone lines are perpendicular to the right sideline. Does this mean both sidelines are parallel? Explain.



10. Draw a Diagram Apple Road is perpendicular to Blueberry Lane. Blueberry Lane is parallel to Cornflower Drive. Cornflower Drive is perpendicular to Daffodil Lane. Daffodil Lane is parallel to Evergreen Drive. Draw a diagram to explain how each street is related to every other street. What can you conclude about Apple Road and Evergreen Drive? Explain.

11. Compare and Contrast How is the Transitive Property of Parallel Lines similar to the Transitive Property of Congruence? How are they different?

12. Writing How is Theorem 3-9 related to the postulates and theorems you learned in Lesson 3-3?