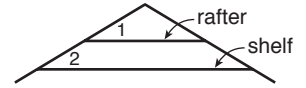


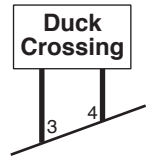
**LESSON**  
**3-3**

**Problem Solving**  
**Proving Lines Parallel**

1. A bedroom has sloping ceilings as shown. Marcel is hanging a shelf below a rafter. If  $m\angle 1 = (8x - 1)^\circ$ ,  $m\angle 2 = (6x + 7)^\circ$ , and  $x = 4$ , show that the shelf is parallel to the rafter above it.

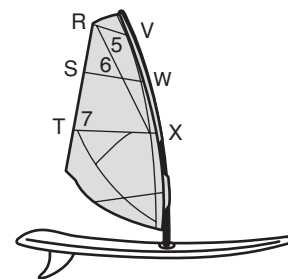
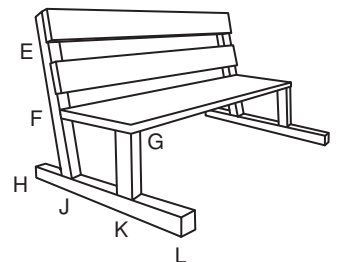


2. In the sign,  $m\angle 3 = (3y + 7)^\circ$ ,  $m\angle 4 = (5y + 5)^\circ$ , and  $y = 21$ . Show that the sign posts are parallel.



**Choose the best answer.**

3. In the bench,  $m\angle EFG = (4n + 16)^\circ$ ,  $m\angle FJL = (3n + 40)^\circ$ ,  $m\angle GKL = (3n + 22)^\circ$ , and  $n = 24$ . Which is a true statement?  
**A**  $\overline{FG} \parallel \overline{HK}$  by the Converse of the Corr.  $\sphericalangle$  Post.  
**B**  $\overline{FG} \parallel \overline{HK}$  by the Converse of the Alt. Int.  $\sphericalangle$  Thm.  
**C**  $\overline{EJ} \parallel \overline{GK}$  by the Converse of the Corr.  $\sphericalangle$  Post.  
**D**  $\overline{EJ} \parallel \overline{GK}$  by the Converse of the Alt. Int.  $\sphericalangle$  Thm.
4. In the windsurfing sail,  $m\angle 5 = (7c + 1)^\circ$ ,  $m\angle 6 = (9c - 1)^\circ$ ,  $m\angle 7 = 17c^\circ$ , and  $c = 6$ . Which is a true statement?  
**F**  $\overline{RV}$  is parallel to  $\overline{SW}$ .  
**G**  $\overline{SW}$  is parallel to  $\overline{TX}$ .  
**H**  $\overline{RT}$  is parallel to  $\overline{VX}$ .  
**J** Cannot conclude that two segments are parallel



The figure shows Natalia's initials, which are monogrammed on her duffel bag. Use the figure for Exercises 5 and 6.



5. If  $m\angle 1 = (4x - 24)^\circ$ ,  $m\angle 2 = (2x + 8)^\circ$ , and  $x = 16$ , show that the sides of the letter N are parallel.
6. If  $m\angle 3 = (7x + 13)^\circ$ ,  $m\angle 4 = (5x + 35)^\circ$ , and  $x = 11$ , show that the sides of the letter H are parallel.