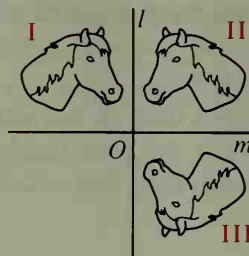
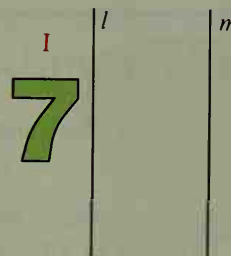


6. Lines  $l$  and  $m$  are perpendicular at  $O$ . Figure I is reflected across line  $l$  to figure II and figure II is reflected across line  $m$  to figure III.



- What single transformation moves figure I directly to figure III?
- Join the eye of figure I to the eye of figure III. How is  $O$  related to these two points?

7. Draw two parallel lines  $l$  and  $m$  and figure I as shown. Then reflect figure I in line  $l$  to figure II and reflect figure II in line  $m$  to figure III.



- What single transformation moves figure I directly to figure III?
- How does the distance between corresponding points in figures I and III compare with the distance between  $l$  and  $m$ ?

8. If you were to fan fold a piece of paper as shown and then cut out the figure shown, can you predict what you would get if you then opened the paper? Try it.



- ★ 9. Can you modify the design cut out in Exercise 8 to create four figures all facing in the same direction?

## Quadrilaterals (Chapter 5)

**Objective:** Investigate the properties of various quadrilaterals and classify them using coordinate methods. (Requires understanding of Lessons 13-1 through 13-7.)

At the bottom of page 172, five ways are shown for proving that a quadrilateral is a parallelogram. At this stage of your learning, coordinate geometry methods can be used for all but the fourth of these methods.

**Example** Prove that quad.  $ABCD$  is a  $\square$ .

**Solution**

**Method 1** Show that both pairs of opposite sides are congruent.

$$AB = \sqrt{(6 - 2)^2 + (4 - 1)^2} = \sqrt{4^2 + 3^2} = \sqrt{25} = 5$$

$$DC = \sqrt{(3 - (-1))^2 + (7 - 4)^2} = \sqrt{4^2 + 3^2} = \sqrt{25} = 5$$

$$AD = \sqrt{(-1 - 2)^2 + (4 - 1)^2} = \sqrt{(-3)^2 + 3^2} = \sqrt{18} = 3\sqrt{2}$$

$$BC = \sqrt{(3 - 6)^2 + (7 - 4)^2} = \sqrt{(-3)^2 + 3^2} = \sqrt{18} = 3\sqrt{2}$$

