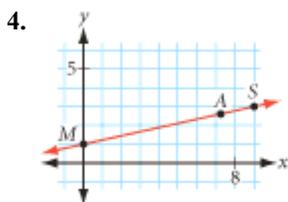


**Practice Your Skills**

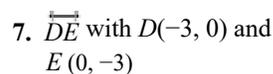
**EXERCISES**

1. In the photos below identify the physical models that represent a point, segment, plane, collinear points, and coplanar points.

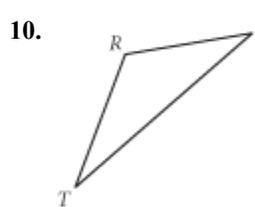
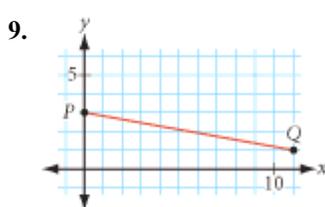
For Exercises 2–4, name each line in two different ways.



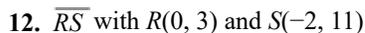
For Exercises 5–7, draw two points and label them. Then use a ruler to draw each line. Don't forget to use arrowheads to show that the line extends indefinitely.



For Exercises 8–10, name each line segment.



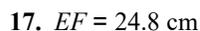
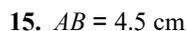
For Exercises 11 and 12, draw and label each line segment.



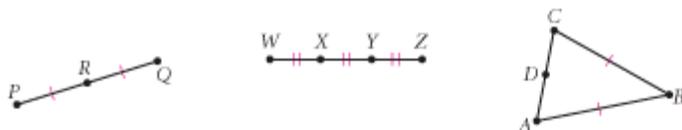
For Exercises 13 and 14, use your ruler to find the length of each line segment to the nearest tenth of a centimeter. Write your answer in the form  $mAB = \underline{\quad}$ .



For Exercises 15–17, use your ruler to draw each segment as accurately as you can. Label each segment.



18. Name each midpoint and the segment it bisects.



19. Draw two segments that have the same midpoint. Mark your drawing to show congruent segments.

20. Draw and mark a figure in which  $M$  is the midpoint of  $\overline{ST}$ ,  $SP = PT$ , and  $T$  is the midpoint of  $\overline{PQ}$ .

For Exercises 21–23, name the ray in two different ways.



For Exercises 24–26, draw and label each ray.

24.  $\overrightarrow{AB}$

25.  $\overrightarrow{YX}$

26.  $\overrightarrow{MN}$

27. Draw a plane containing four coplanar points  $A$ ,  $B$ ,  $C$ , and  $D$ , with exactly three collinear points  $A$ ,  $B$ , and  $D$ .

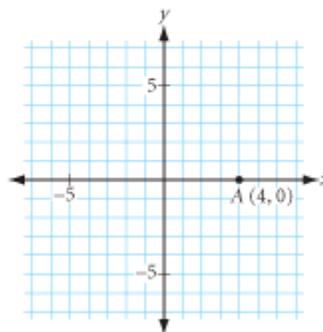
28. Given two points  $A$  and  $B$ , there is only one segment that you can name:  $AB$ . With three collinear points  $A$ ,  $B$ , and  $C$ , there are three different segments that you can name:  $\overline{AB}$ ,  $\overline{AC}$ , and  $\overline{BC}$ . With five collinear points  $A$ ,  $B$ ,  $C$ ,  $D$ , and  $E$ , how many different segments can you name?

For Exercises 29–31, draw axes on graph paper and locate point  $A(4, 0)$  as shown.

29. Draw  $\overline{AB}$  where point  $B$  has coordinates  $(2, -6)$ .

30. Draw  $\overline{OM}$  with endpoint  $(0, 0)$  that goes through point  $M(2, 2)$ .

31. Draw  $\overline{CD}$  through points  $C(-2, 1)$  and  $D(-2, -3)$ .



**Career**

**CONNECTION**

Woodworkers use a tool called a plane to shave a rough wooden surface to create a perfectly smooth planar surface. The smooth board can then be made into a tabletop, a door, or a cabinet.

Woodworking is a very precise process. Producing high-quality pieces requires an understanding of lines, planes, and angles as well as careful measurements.



32. If the signs of the coordinates of collinear points  $P(-6, -2)$ ,  $Q(-5, 2)$ , and  $R(-4, 6)$  are reversed, are the three new points still collinear? Draw a picture and explain why.
33. Draw a segment with midpoint  $N(-3, 2)$ . Label it  $\overline{PQ}$ .
34. Copy triangle  $TRY$  shown at right. Use your ruler to find the midpoint  $A$  of side  $\overline{TR}$  and the midpoint  $G$  of side  $\overline{TY}$ . Draw  $\overline{AG}$ .
35. Use your ruler to draw a triangle with side lengths 8 cm and 11 cm. Explain your method. Can you draw a second triangle with these two side lengths that looks different from the first?



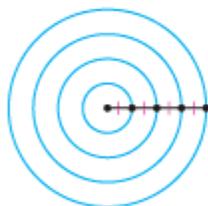
## project

### SPIRAL DESIGNS

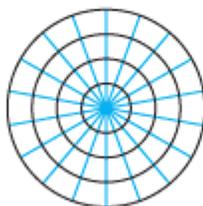
The circle design shown below is used in a variety of cultures to create mosaic decorations. The spiral design may have been inspired by patterns in nature. Notice that the seeds on the sunflower also spiral out from the center.



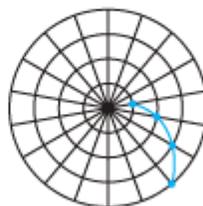
Create and decorate your own spiral design. Here are the steps to make the spirals. The more circles and radii you draw, the more detailed your design will be.



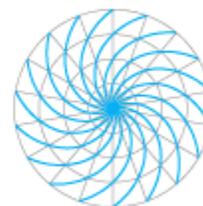
Step 1



Step 2



Step 3



Step 4

- ▶ A completed spiral.
- ▶ Coloring or decorations that make the spiral stand out.

For help, see the **Dynamic Geometry Exploration** Spiral Designs at

[math.kendallhunt.com/DG](http://math.kendallhunt.com/DG)

[keymath.com/DG](http://keymath.com/DG)

