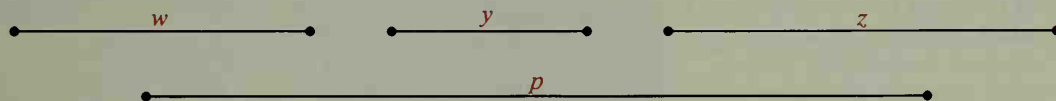


Written Exercises

In each of Exercises 1–4 begin by drawing \overline{AB} roughly 15 cm long.

- A**
1. Divide \overline{AB} into three congruent segments.
 2. a. Use Construction 12 to divide \overline{AB} into four congruent segments.
b. Use Construction 4 to divide \overline{AB} into four congruent segments.
 3. a. Use Construction 12 to divide \overline{AB} into five congruent segments.
b. Can Construction 4 be used to divide \overline{AB} into five congruent segments?
c. Divide \overline{AB} into two segments that have the ratio 2:3.
 4. Divide \overline{AB} into two segments that have the ratio 3:4.

On your paper draw four segments roughly as long as those shown below. Use your segments in Exercises 5–14. In each exercise construct a segment that has length x satisfying the given condition.



$$5. \frac{y}{w} = \frac{z}{x} \quad 6. \frac{w}{x} = \frac{x}{y} \quad 7. x = \sqrt{yp} \quad 8. 3x = w + 2y$$

- B**
9. $zx = wy$ (Hint: First write a proportion that is equivalent to the given equation and has x as the last term.)

$$10. x = \frac{yp}{z} \quad 11. x = \frac{1}{3}\sqrt{yp} \quad 12. x = \sqrt{3wz} \quad 13. x = \sqrt{6yz}$$

14. Construct \overline{AB} , with $AB = p$. Divide \overline{AB} into two parts that have the ratio $w:y$.

15. Draw a segment like the one shown and let its length be 1. Use the segment to construct a segment of length $\sqrt{15}$.



16. a. If $x = a\sqrt{n}$, then x is the geometric mean between a and $\underline{\hspace{1cm}}$.
b. Draw a segment about 3 cm long. Call its length a . Use your results from part (a) to construct a segment of length $a\sqrt{n}$ for $n = 2, 3$, and 4.

- C**
17. Draw \overline{CD} about 20 cm long. Construct a triangle whose perimeter is equal to CD and whose sides are in the ratio 2:2:3.

- ★ 18. To trisect a general angle G , a student tried this procedure:

1. Mark off \overline{GA} congruent to \overline{GB} .
2. Draw \overline{AB} .
3. Divide \overline{AB} into three congruent parts using Construction 12.
4. Draw \overline{GX} and \overline{GY} .

Show that the student did not trisect $\angle G$. (Hint: Show that $GA > GY$. Then use an indirect proof to show that $m\angle 2 \neq m\angle 1$.)

