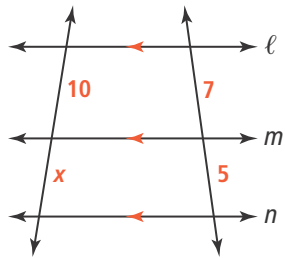




**UNDERSTAND**

12. **Error Analysis** What is Benson's error?

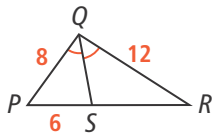


$$\frac{5}{10} = \frac{x}{7}$$

$$10x = 35$$

$$x = 3.5$$

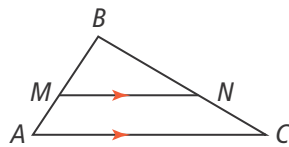
13. **Mathematical Connections** What percent of the area of  $\triangle PQR$  is the area of  $\triangle QRS$ ? Explain.



14. **Construct Arguments** Write a proof of the Side-Splitter Theorem.

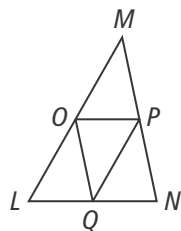
Given:  $\overline{MN} \parallel \overline{AC}$

Prove:  $\frac{AM}{MB} = \frac{CN}{NB}$



15. **Higher Order Thinking**

Suppose  $O$ ,  $P$ , and  $Q$  are midpoints of the sides of  $\triangle LMN$ . Show that  $\triangle LOQ$ ,  $\triangle OMP$ ,  $\triangle QPN$ , and  $\triangle PQO$  are congruent to each other.



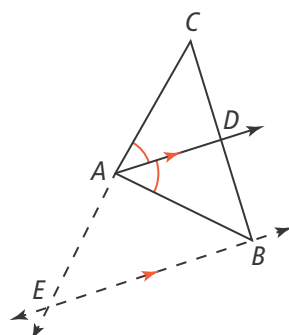
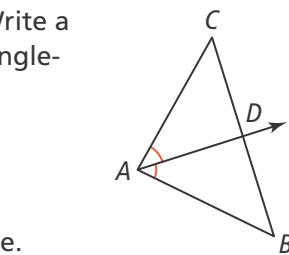
16. **Construct Arguments** Write a proof for the Triangle-Angle-Bisector Theorem.

Given:  $\overline{AD}$  bisects  $\angle A$ .

Prove:  $\frac{CA}{AB} = \frac{CD}{DB}$

Use the following outline.

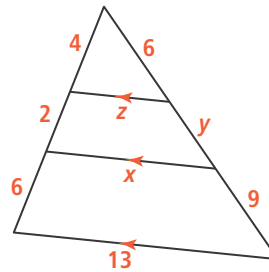
- Extend  $\overline{CA}$  and draw a line through point  $B$  parallel to  $\overline{AD}$  that intersects  $\overline{CA}$  at point  $E$ .
- Show that  $\frac{CA}{AE} = \frac{CD}{DB}$ .
- Then show that  $\triangle AEB$  is isosceles.



**PRACTICE**

For Exercises 17–19, find each value.

SEE EXAMPLES 1 AND 2

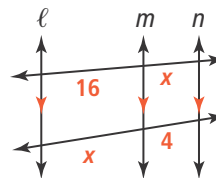


17.  $x$

18.  $y$

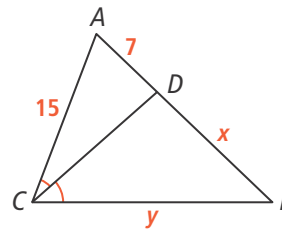
19.  $z$

20. What is the value of  $x$ ? SEE EXAMPLE 3



For Exercises 21–23, find each value of  $x$  for the given value of  $y$ . Round to the nearest tenth.

SEE EXAMPLES 4 AND 5



21.  $y = 16$

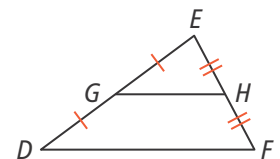
22.  $y = 20$

23.  $y = 18$

24. Write a proof of the Triangle Midsegment Theorem.

Given:  $\overline{DG} \cong \overline{GE}$ ,  $\overline{FH} \cong \overline{HE}$

Prove:  $\overline{GH} \parallel \overline{DF}$ ,  $GH = \frac{1}{2}DF$

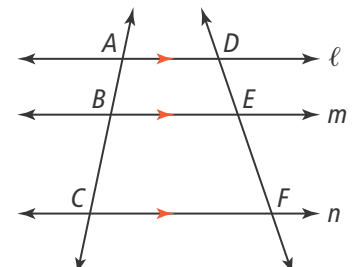


25. Write a proof of the Corollary to the Side-Splitter Theorem.

Given:  $\ell \parallel m \parallel n$

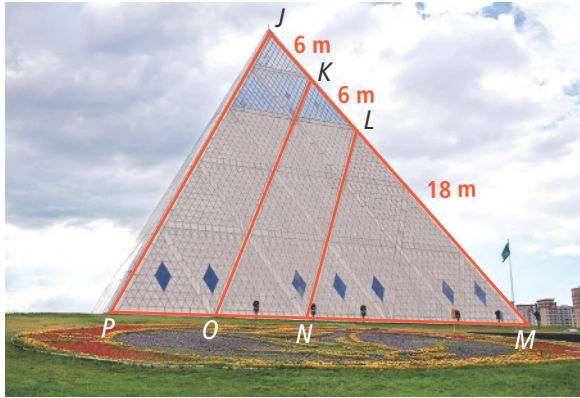
Prove:  $\frac{AB}{BC} = \frac{DE}{EF}$

Hint: Draw  $\overline{AF}$ . Label the intersection of  $\overline{AF}$  and  $\overline{BE}$  point  $G$ .

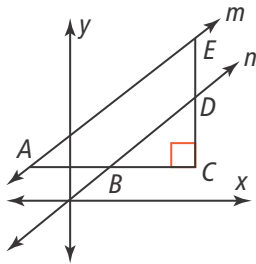


**APPLY**

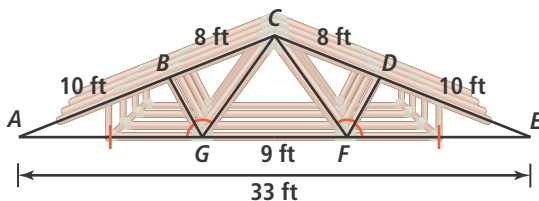
26. **Use Structure** A building in the shape of a pyramid needs to have supports repaired, and two parallel sections need to be reinforced. The face of the building is an equilateral triangle. What are the lengths of  $\overline{KO}$  and  $\overline{LN}$ ?



27. **Higher Order Thinking** Use the figure to prove Theorem 2-13: Two non-vertical lines are parallel if and only if they have the same slope.

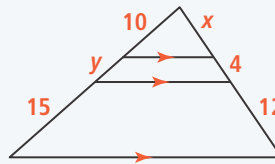


- Assume the slopes of lines  $m$  and  $n$  are equal. Use proportions in  $\triangle ACE$  and  $\triangle BCD$  to show that  $m \parallel n$ .
  - Now assume that  $m \parallel n$ . Show that the slopes of  $m$  and  $n$  are equal.
28. **Use Structure** Aisha is building a roof and needs to determine the lengths of  $\overline{CG}$  and  $\overline{CF}$  from the design shown. How can she determine  $\overline{CG}$  and  $\overline{CF}$ ? What are  $\overline{CG}$  and  $\overline{CF}$ ?

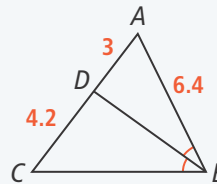


**ASSESSMENT PRACTICE**

29. What is the value of  $x$ ?

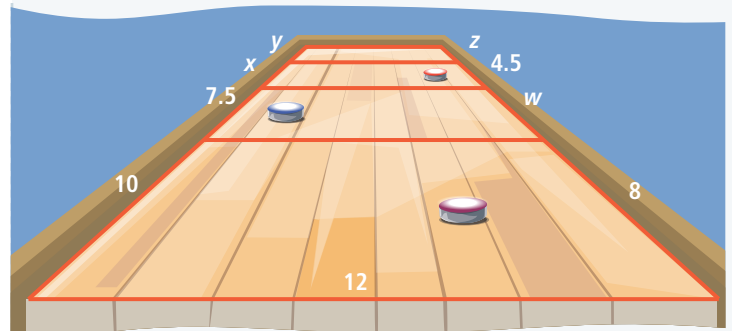


30. **SAT/ACT** What is the measure of side  $\overline{CB}$ ?



- (A) 4.57    (B) 6.4    (C) 8.96    (D) 9.4

31. **Performance Task** Emma is determining measurements needed to simulate the distances in a shuffleboard computer game that she is programming.



**Part A** The horizontal lines must be parallel and in proportion so that each zone of the shuffleboard appears to be the same length. What are the lengths  $w$ ,  $x$ , and  $y$ ?

**Part B** What is the length of each horizontal segment?

**Part C** Which horizontal segment is closest to the midsegment of the triangle that extends off of the screen? How do you know?