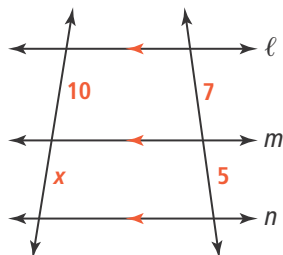




UNDERSTAND

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

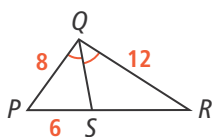


$$\frac{5}{10} = \frac{x}{7}$$

$$10x = 35$$

$$x = 3.5$$

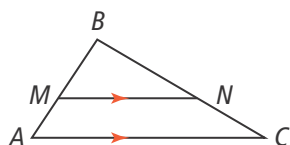
13. **Mathematical Connections** What percent of the area of $\triangle PQR$ is the area of $\triangle QRS$? Explain.



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

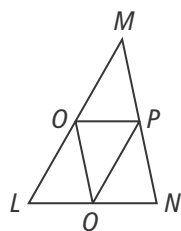
Given: $\overline{MN} \parallel \overline{AC}$

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.



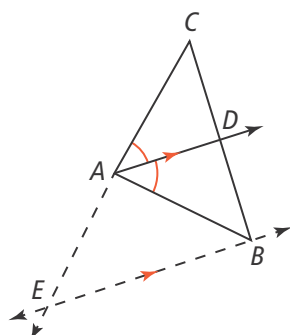
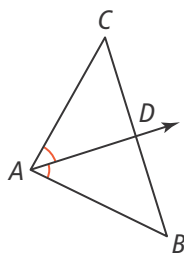
16. **Construct Arguments** Write a proof for the Triangle-Angle-Bisector Theorem.

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

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

Use the following outline.

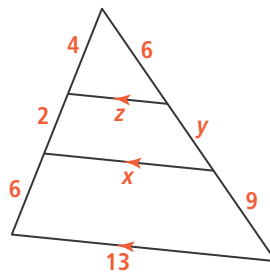
- Extend $\overline{CA}$ and draw a line through point B parallel to $\overline{AD}$ that intersects $\overline{CA}$ at point E .
- Show that $\frac{CA}{AE} = \frac{CD}{DB}$.
- Then show that $\triangle AEB$ is isosceles.



PRACTICE

For Exercises 17–19, find each value.

SEE EXAMPLES 1 AND 2

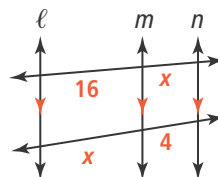


17. x

18. y

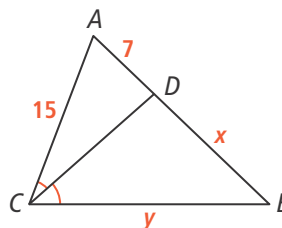
19. z

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. $y = 16$

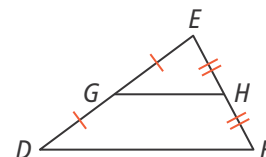
22. $y = 20$

23. $y = 18$

24. Write a proof of the Triangle Midsegment Theorem.

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

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

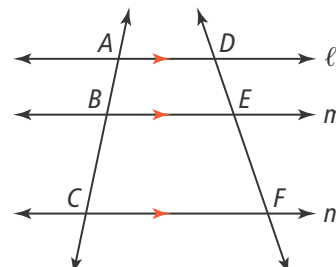


25. Write a proof of the Corollary to the Side-Splitter Theorem.

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

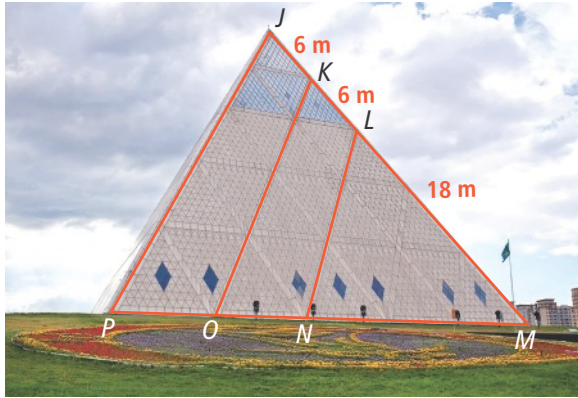
Prove: $\frac{AB}{BC} = \frac{DE}{EF}$

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

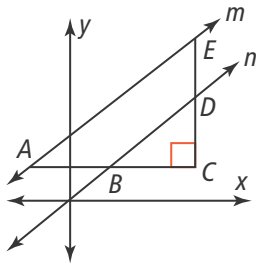


APPLY

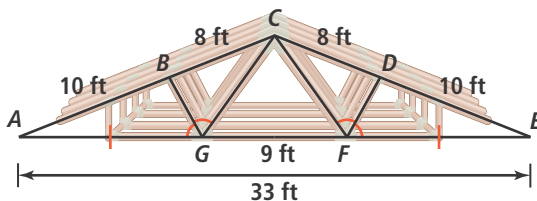
26. **Use Structure** A building in the shape of a pyramid needs to have supports repaired, and two parallel sections need to be reinforced. The face of the building is an equilateral triangle. What are the lengths of $\overline{KO}$ and $\overline{LN}$?



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.

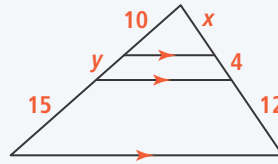


- Assume the slopes of lines m and n are equal. Use proportions in $\triangle ACE$ and $\triangle BCD$ to show that $m \parallel n$.
 - Now assume that $m \parallel n$. Show that the slopes of m and n are equal.
28. **Use Structure** Aisha is building a roof and needs to determine the lengths of $\overline{CG}$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

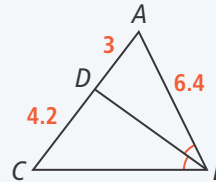


ASSESSMENT PRACTICE

29. What is the value of x ?

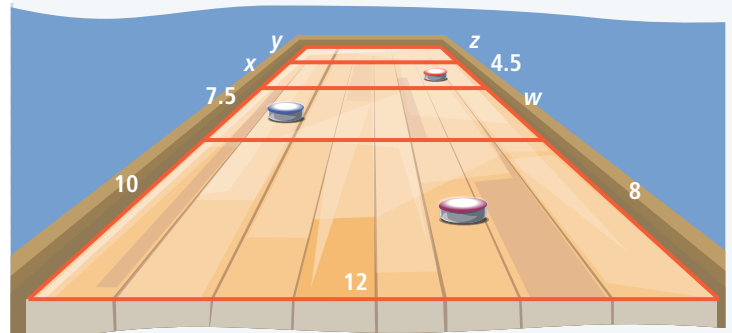


30. **SAT/ACT** What is the measure of side $\overline{CB}$?



- Ⓐ 4.57 Ⓑ 6.4 Ⓒ 8.96 Ⓓ 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?