6.3 Side Splitter Theorem

**Definition**
If a line is parallel to one side of a triangle and intersects the other two sides, then

**If…**
\[ MA \parallel TH \]

**Then…**

**PROVE IT**

**TRY IT!**
**Corollary to Side-Splitter Theorem**

<table>
<thead>
<tr>
<th>Definition</th>
<th>If...</th>
<th>Then...</th>
</tr>
</thead>
<tbody>
<tr>
<td>If three parallel lines intersect two transversals, then</td>
<td>$GO \parallel MA \parallel TH$</td>
<td></td>
</tr>
</tbody>
</table>

**TRY IT!**

![Diagram](image)

**Summarize your notes!**
6.3 PRACTICE

Find the missing length indicated.

1. \[ ? \quad 15 \]
2. \[ ? \quad 36 \]
3. \[ 6 \]

4. \[ 3x \]
5. \[ 2x - 12 \]
6. \[ 8 \]

Solve for \( x \).

7. \[ 27 \quad 15 \quad ? \]
8. \[ ? \quad 5 \quad 4 \]
9. \[ 14 \]

Find the missing length indicated.

10. \[ 5 \quad 3 \]
11. \[ 16 \]
12. \[ -2 + 6x \]
13. \[ 18 \]
14. \[ 16 \]
15. \[ 8 \]
Solve for \( x \).

10.

11.

12.

**ALGEBRA REVIEW**

<table>
<thead>
<tr>
<th>SOLVE</th>
<th>GRAPH</th>
<th>MULTIPLY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Simplify your solution</td>
<td></td>
<td></td>
</tr>
<tr>
<td>( 3x^2 = 54 )</td>
<td></td>
<td>((2x - 3)(2x + 3))</td>
</tr>
</tbody>
</table>

<table>
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<tr>
<th>SOLVE</th>
<th>GRAPH</th>
<th>FACTOR</th>
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<tr>
<td>Simplify your solution</td>
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<tr>
<td>( x^2 + 8 = 40 )</td>
<td></td>
<td>( x^2 + 20x + 36 )</td>
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</table>
6.3 APPLICATION

1. Find the missing length indicated.

2. Find $x$.

Watch the application walk through video if you need extra help getting started!

1. **NATURE** Below is a picture of an auger shell. Find $x$ and $y$.

2. **BOATING** Captain Sully sets sail for a 3 hour tour. The weather starts getting rough, the tiny ship was tough. If not for the courage of the fearless math teacher, the ship would be lost, the ship would be lost. Find $x$ and $y$. 
3. **Coordinate Geometry**
   
a. Plot the points on the graph below to make $\triangle AGY$.
   \[ A = (-3,0) \quad G = (-1,8) \quad Y = (7,2) \]

b. Plot the points on the graph below to make $\overline{NR}$.
   \[ N = (-2,4) \quad R = (3,5) \]

c. Is $\overline{NR}$ parallel to $\overline{AY}$? Explain how you know.

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Mr. Brust finds that some students get angry at the application problems and may have rage issues. Without losing it, answer letter d.

d. Use the distance formula to prove the side splitter theorem is true.
   \[
   \frac{AN}{NG} = \frac{RY}{GR}
   \]