Is either $\triangle LMN$ or $\triangle RST$ similar to $\triangle ABC$?

1. 
   \[
   \begin{array}{ccc}
   A & L & R \\
   B & M & S \\
   C & N & T \\
   \end{array}
   \]

2. 
   \[
   \begin{array}{ccc}
   A & M & S \\
   B & L & T \\
   C & N & R \\
   \end{array}
   \]

Determine whether the two triangles are similar. If they are similar, write a similarity statement and find the scale factor of $\triangle A$ to $\triangle B$.

3. 
   \[
   \begin{array}{ccc}
   J & A & X \\
   K & L & B \\
   \end{array}
   
   \text{Not drawn to scale}
   \]

4. 
   \[
   \begin{array}{ccc}
   X & A & B \\
   Z & L & Y \\
   \end{array}
   \]

5. **Algebra** Find the value of $m$ that makes $\triangle ABC \sim \triangle DEF$ when $AB = 3$, $BC = 4$, $DE = 2m$, $EF = m + 5$, and $\angle B \cong \angle E$.

Show that the triangles are similar and write a similarity statement. 
*Explain* your reasoning.

6. 
   \[
   \begin{array}{ccc}
   P & Q & G \\
   T & R & H \\
   \end{array}
   \]

7. 
   \[
   \begin{array}{ccc}
   G & H & M \\
   K & N & \end{array}
   \]
8. **Multiple Choice**  In the diagram at the right, \( \triangle ACE \sim \triangle DCB \). Find the length of \( AB \).

   A. 12   
   B. 18   
   C. \( \frac{35}{2} \)   
   D. \( \frac{30}{7} \)

Sketch the triangles using the given description. **Explain** whether the two triangles can be similar.

9. The side lengths of \( \triangle ABC \) are 8, 10 and 14. 

   The side lengths of \( \triangle DEF \) are 16, 20 and 26.

10. In \( \triangle ABC \), \( AB = 15 \), \( BC = 24 \) and \( m \angle B = 38^\circ \).

    In \( \triangle DEF \), \( DE = 5 \), \( EF = 8 \) and \( m \angle E = 38^\circ \).

In Exercises 11–14, use the diagram at the right to copy and complete the statement.

11. \( \triangle ABC \sim ? \)

12. \( m \angle DCE = ? \)

13. \( AB = ? \)

14. \( m \angle CAB + m \angle ABC = ? \)

In Exercises 15 and 16, use the following information.

**Pine Tree**  In order to estimate the height \( h \) of a tall pine tree, a student places a mirror on the ground and stands where she can see the top of the tree, as shown. The student is 6 feet tall and stands 3 feet from the mirror which is 11 feet from the base of the tree.

15. What is the height \( h \) (in feet) of the pine tree?

16. Another student also wants to see the top of the tree. The other student is 5.5 feet tall. If the mirror is to remain 3 feet from the student’s feet, how far from the base of the tree should the mirror be placed?