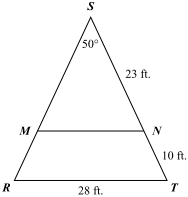
2010 Spring Release, Mathematics - Grade 10 **[icon_pdf](http://www.doe.mass.edu/mcas/pdf/2010/182844.pdf)**Question 41: Open-Response  
Reporting Category: GeometryStandard: 10.G.4 - Apply congruence and similarity correspondences (e.g., △ABC ≅ △XYZ) and properties of the figures to find missing parts of geometric figures, and provide logical justification.

This item allows use of a calculator

The diagram below shows triangle RST

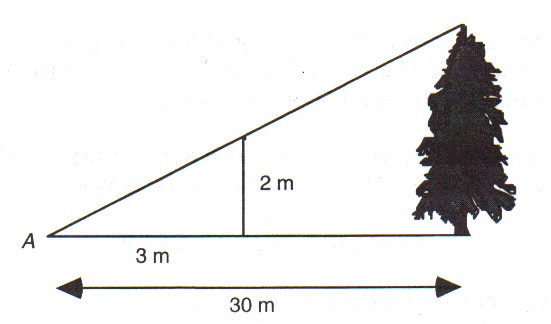


* triangle RST is an isosceles triangle with congruent sides line segment RS and line segment ST.
* Point M lies on line segment RS, and point N lies on line segment ST.
* line segment MN is parallel to line segment RT.
* The length of line segment SN is 23 feet, and the length of line segment NT is 10 feet.

1. What is the length of line segment RS? Show or explain how you got your answer.
2. What is measure angle T? Show or explain how you got your answer.
3. What is measure angle MNS? Show or explain how you got your answer.
4. Explain why triangle MNS is similar to triangle RTS.
5. What is the length of line segment MN? Show or explain how you got your answer.

2. Please answer the following using diagram below. A stick 2m long is placed vertically so that its top is in line with the top of a tree, from a point A, which is 3m from the stick and 30m from the tree.

C



B

E

D

a. Is ? If so, state the theorem or postulate and explain your reasoning.

b. How tall is the tree? Show work or explain.

c. Find the distance AC. (Round to the nearest foot.) Show work or explain.

d. If , find the measure of .