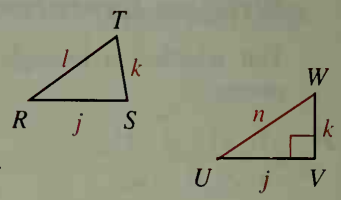
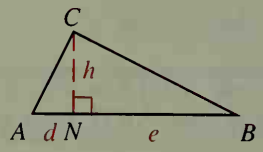
20. a. Complete this statement of Theorem 8-4:
If the square of the longest side of a triangle ___?___.

b. Prove Theorem 8-4.

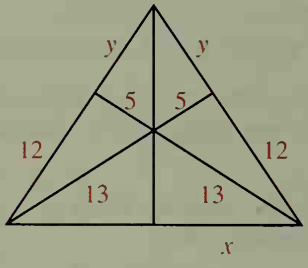
Given: $\triangle RST$; $\overline{RT}$ is the longest side; $l^2 < j^2 + k^2$
Prove: $\triangle RST$ is an acute triangle.
(*Hint*: Start by drawing right $\triangle UVW$ with legs j and k. Compare lengths l and n.)

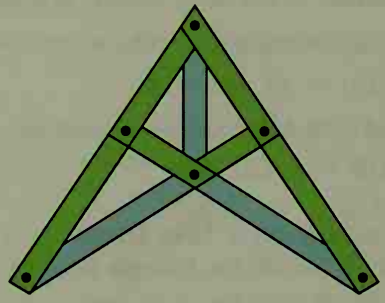


C **21.** Given: $\overline{CN} \perp \overline{AB}$;
h is the geometric mean between d and e.
Prove: $\triangle ABC$ is a right triangle.



22. A frame in the shape of the simple *scissors truss* shown at the right below can be used to support a peaked roof. The weight of the roof compresses some parts of the frame (green), while other parts are in tension (blue). A frame made with s segments joined at j points is stable if $s \geq 2j - 3$. In the truss shown, 9 segments connect 6 points. Verify that the truss is stable. Then find the values of x and y.





Explorations

These exploratory exercises can be done using a computer with a program that draws and measures geometric figures.

The sides of a quadrilateral have lengths a, b, c, and d. The diagonals have lengths e and f. For what kinds of quadrilaterals does

$$a^2 + b^2 + c^2 + d^2 = e^2 + f^2?$$

Draw various quadrilaterals including a parallelogram, rectangle, rhombus, trapezoid, and a random quadrilateral.