7. The circle of Steps 1–3 and the circle of Steps 4–6 must be the same circle, because $\overline{MX}$ is a diameter of both circles.
8. There is a circle that passes through the nine points, L, M, N, R, S, T, X, Y, and Z. (See Steps 3 and 6.)

One way to locate the center of the circle is to locate points X and M, then the midpoint of $\overline{XM}$.

Exercises

1. Test your mechanical skill by constructing the nine-point circle for an acute triangle. (The larger the figure, the better.)
2. Repeat Exercise 1, but use an obtuse triangle.
3. Repeat Exercise 1, but use an equilateral triangle. What happens to some of the nine points?
4. Repeat Exercise 1, but use a right triangle. How many of the nine points are at the vertex of the right angle?
5. Prove that $XYMN$ is a rectangle. Use the diagram shown for Steps 1–3 of the key steps of proof. (*Hint*: Compare $\overline{NM}$ with $\overline{AB}$ and $\overline{NX}$ with $\overline{CR}$.)
6. What is the ratio of the radius of the nine-point circle to the radius of the circumscribed circle?

Chapter Summary

1. Geometric constructions are diagrams that are drawn using only a straightedge and a compass.
2. Basic constructions:
   (1) A segment congruent to a given segment, page 375
   (2) An angle congruent to a given angle, page 376
   (3) The bisector of a given angle, page 376
   (4) The perpendicular bisector of a given segment, page 380
   (5) A line perpendicular to a given line at a given point on the line, page 381
   (6) A line perpendicular to a given line from a given point outside the line, page 381
   (7) A line parallel to a given line through a given point outside the line, page 382
   (8) A tangent to a given circle at a given point on the circle, page 392
   (9) A tangent to a given circle from a given point outside the circle, page 393
   (10) A circle circumscribed about a given triangle, page 393
   (11) A circle inscribed in a given triangle, page 394