

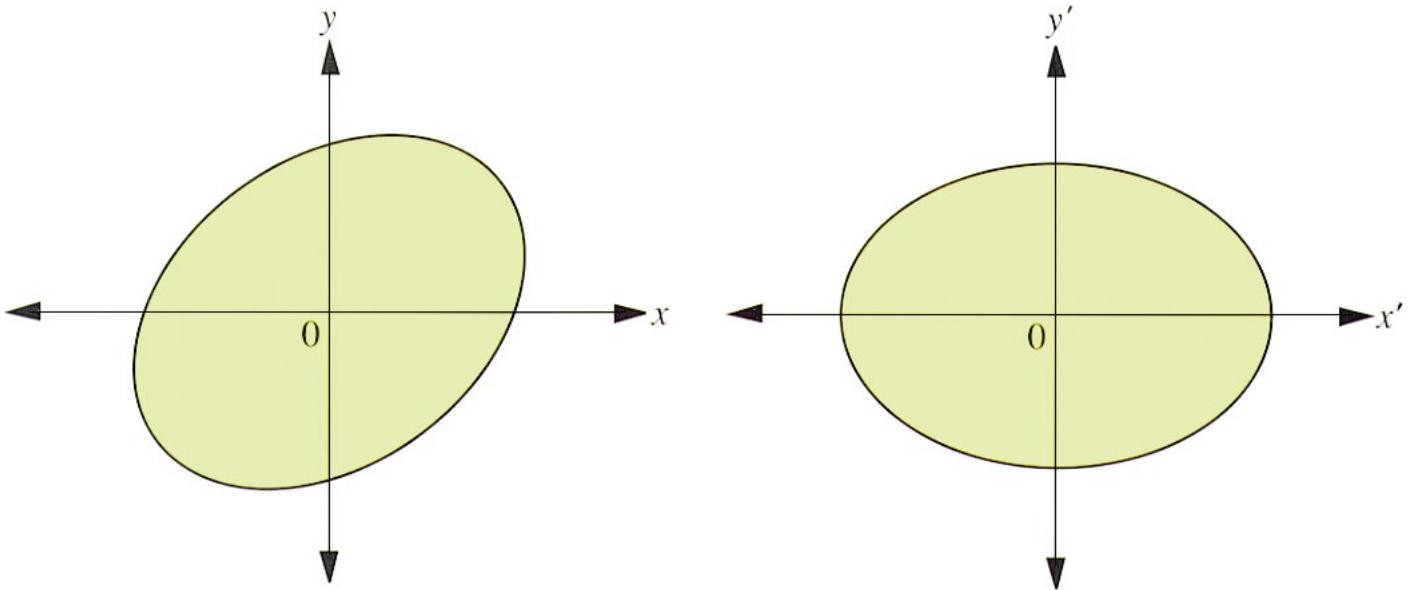
The Titled Ellipse

Problem-of-the-Week

The Problem

Find a relationship between the trigonometric equation at the right and the two figures below. The equation for the tilted ellipse on the left is $34x^2 - 24xy + 41y^2 - 200 = 0$.

$$\tan 2R = \frac{B}{A - C}$$



Strategies and Hints

1. Trace both ellipses on to the same sheet of paper. Draw in the major (long) axes of the ellipses. How are the ellipses the same? How are they different? How do the axes compare?
2. Start by making a guess as to which angle R might be. The drawing at the right gives you a clue. Use a protractor to measure angle R .
3. Find the tangent of twice R .
4. The term -200 in the equation for the tilted ellipse plays no part in the solution of this problem. Find a way to relate the coefficients of the other three terms to the given trigonometric equation.

