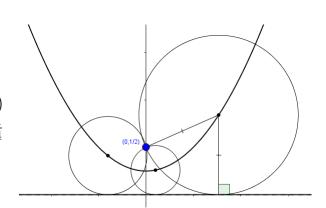
Problem 45

Write a simplified equation in the form of y = f(x), which describes the locus of centers of all circles which pass through the point $(0, \frac{1}{2})$ and are tangent to the *x*-axis.

Answer

$$y = x^2 + \frac{1}{4}$$

Explanation



The locus of points is a parabola with focus $(0, \frac{1}{2})$ and directrix y = 0. So, the equation is $y = x^2 + \frac{1}{4}$