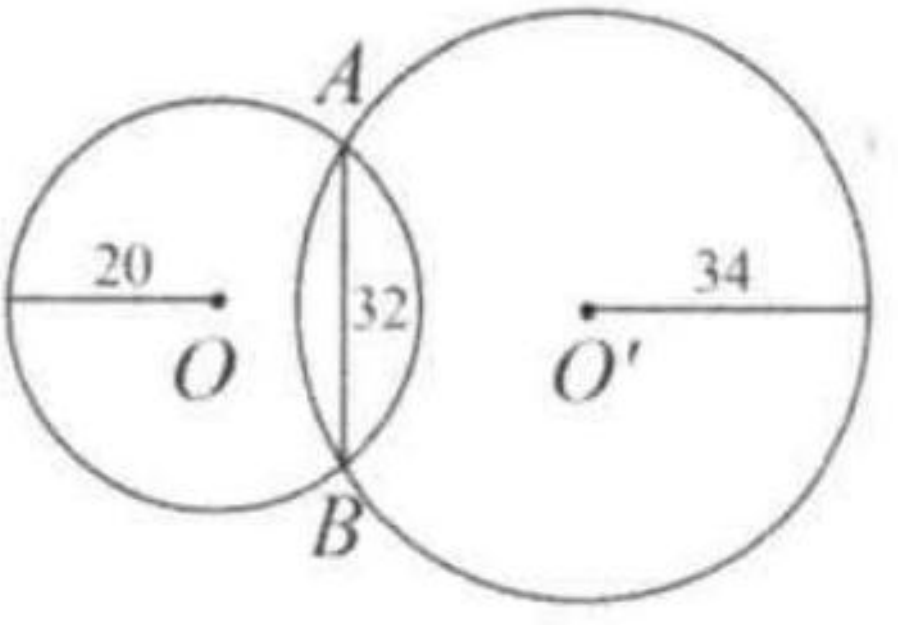
Problem 4

Problem

As shown in the figure, AB is the common chord with the length 32 of two intersecting circles O and O'. The radii are 20 feet and 34 feet, respectively. Find the distance between the centers of the circles.

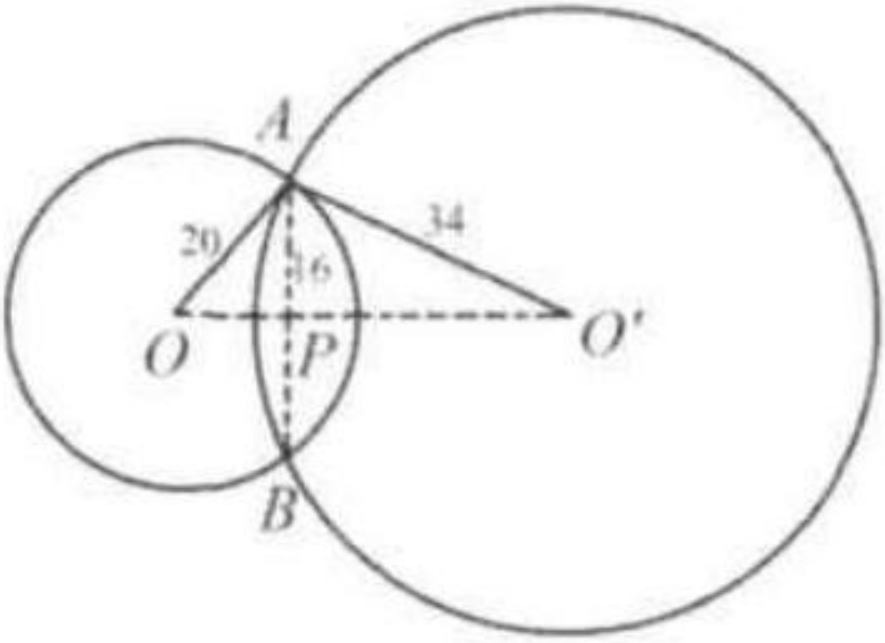
(A) 54
(B) 42
(C) $\sqrt{1763}$
(D) 30
(E) 40



Solution

(B).
Let the midpoint of the chord AB be P. Applying the Pythagorean Theorem applied to right triangles OPA and $O'PA$ gives

$OP^2 = OA^2 - AP^2 = 20^2 - 16^2 = 144, \quad OP = 12$, And
$O'P^2 = O'A^2 - AP^2 = 34^2 - 16^2 = 900, \quad O'P = 30.$
The distance between the centers of the circles is $30 + 12 =$



42.