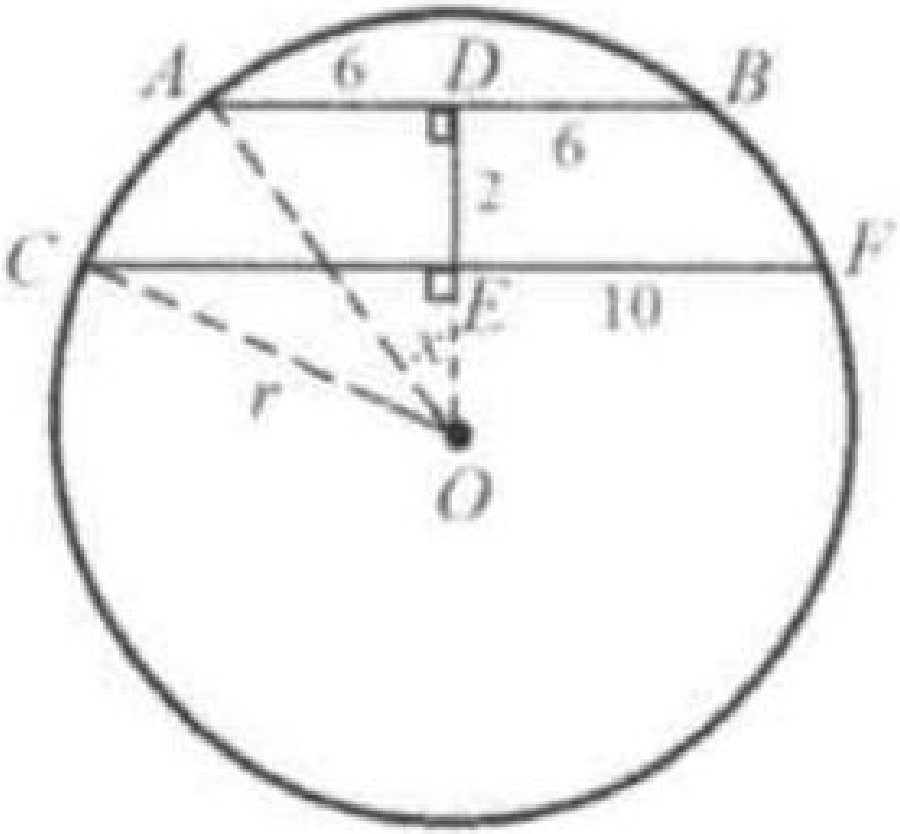
Problem 11

Problem

Two parallel chords on the same side of the center of a circle are 12 inches and 20 inches long and 2 inches apart. Find the radius of the circle. Express your answer in simplest radical form.

Solution

$5\sqrt{13}$. Let r be the radius of the circle. A B $= 10. AD = 6. CF = 20.$
$CE = 10. DE = 2. OE = x.$



Applying Pythagorean Theorem to right triangles ADO and CEO: $AD^2 + DO^2 = CE^2 + OE^2 \quad \Rightarrow$
$6^2 + (2+x)^2 = 10^2 + x^2 \quad \Rightarrow x = 15.$
$r = \sqrt{CE^2 + OE^2} = \sqrt{10^2 + 15^2} = 5\sqrt{13}.$