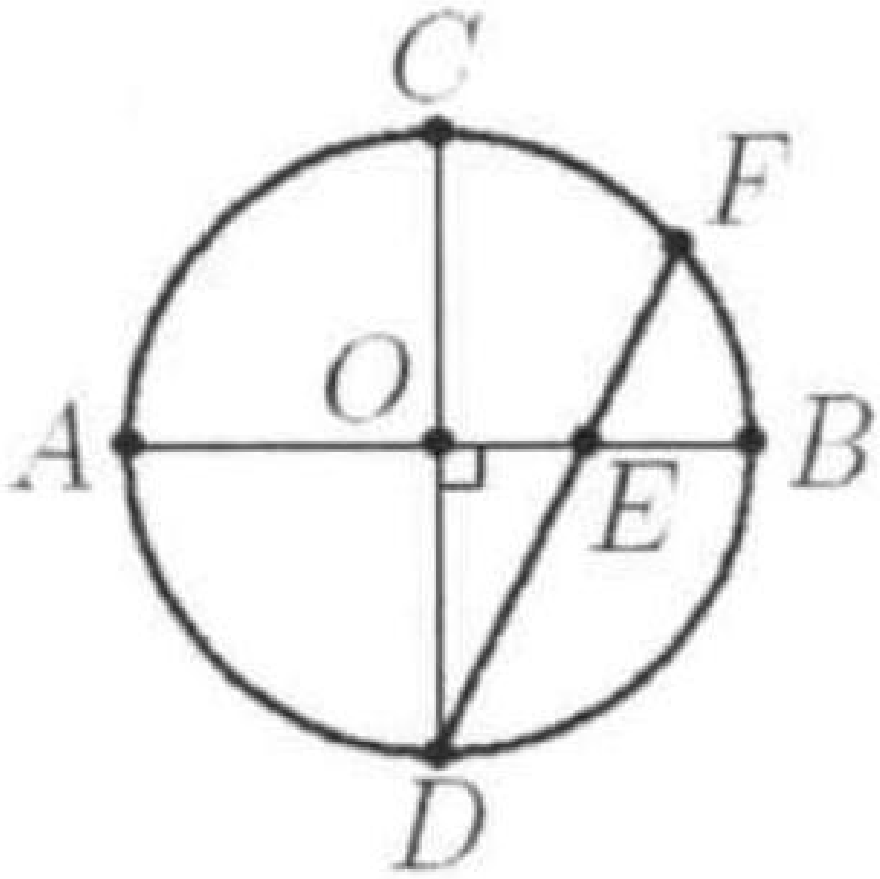
Problem 8

Problem

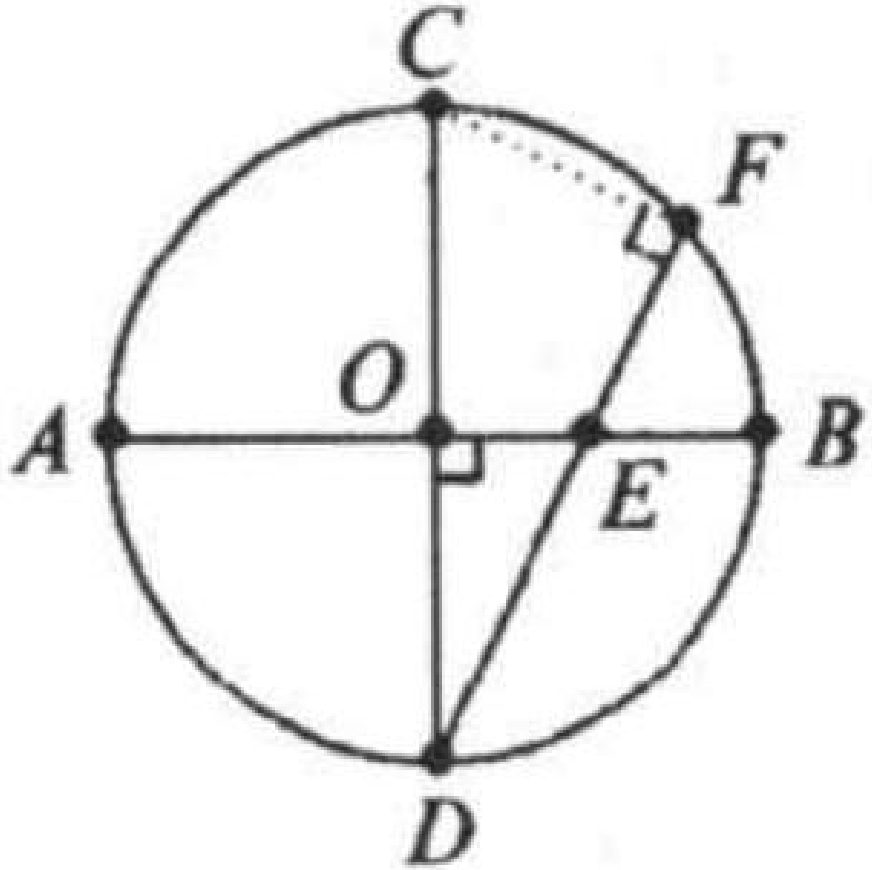
As shown in the figure, AB and CD are diameters of the circle O.AB and CD are perpendicular. $\angle CDF = 30°$. Chord DF intersects AB at E with $DE = 10$ and $EF = 5$. Find the area of the circle.

(A) 25π
(B) $\frac{75}{2}\pi$
(C) 75π
(D) $\frac{95}{2}\pi$
(E) 95π



Solution

(C).
Connect CF. Angle CFD forms a right angle and CDF is a $30^\circ - 60^\circ - 90^\circ$ right triangle. It follows that the ratio of the sides is $1 : \sqrt{3} : 2$.
Since $DF = 10 + 5 = 15, CF = 5\sqrt{3} = r$. The area is $\pi r^2 =$



$\pi(5\sqrt{3})^2 = 75\pi.$