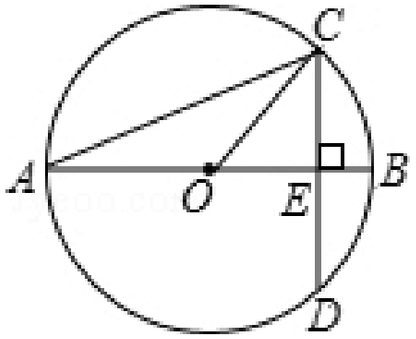


**Question:**

As shown in the figure, angle CAO = 22.5, OC = 6.0, then the length of CD is ()?

**Answer:**

$6\sqrt{2}$

## Ours

✔ From the given information, we have ∠COE = 2 ∠CAO = 45°

✔ Since CE is perpendicular to AB, we have ∠OCE = 90° - ∠COE = 45°

✔ Therefore, triangle COE is an isosceles right triangle.

✔ Thus, $OE = CE = \frac{\sqrt{2}}{2} \times OC = 3\sqrt{2}$. Therefore, $CD = 2CE = \mathbf{6\sqrt{2}}$.

## ChatGPT-4o

✔ In triangle COE, ∠CAO = 22.5° is an angle between line segment CA and diameter AB. Triangle COA is within a circle with diameter AB, so AO is the radius.

✘ Use trigonometry in triangle COA, $\sin(\angle CAO) = OE / OC$. So, $OE = OC \times \sin(\angle CAO) = 6 \times \sin(22.5°) \approx 6 \times 0.3827 \approx 2.296$

✘ In triangle CED (right triangle), the vertical leg from E to D is the same as OE. So, $CD = OE \approx 2.296$

## Qwen2.5-VL-7B

✔ Identify Key Properties: Since AB is a diameter of the circle, ∠ACB=90° (by the Inscribed Angle Theorem). OC is a radius of the circle, so OC=OA=OB=R, where R is the radius. Given OC=6.0, the radius R=6.0.

✘ Place the center O at the origin (0,0) of a coordinate system. Let A=(−6,0) and C=(6,0) since OA=OC=6. Since ∠CAO=22.5°, C=(6cos(22.5°),6sin(22.5°))=(4.87,2.42).

✘ Since CD is the vertical distance from C to the x-axis, which is simply the y-coordinate of C: $CD = 6\sin(22.5°) = 6 \cdot \frac{\sqrt{2-\sqrt{2}}}{2} = 3\sqrt{2-\sqrt{2}} \approx 3$