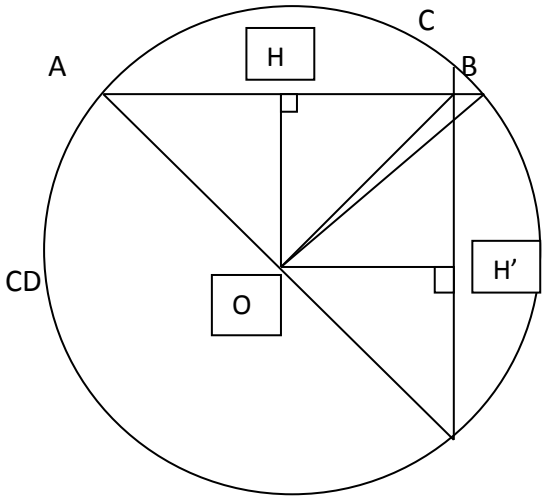
Answer on Question #80596 – Math – Geometry

Question

In a circle if 10 cm diameter is drawn horizontally and 8cm diameter is drawn vertically it intersects. (Diameter doesn't go through the centre of the circle) What's the radius of the circle?

Solution



AB = 10, CD = 8, AO = r = ?

The triangles of the AHO and DH'O are similar.

AH/OH' = HO/H'D

OH' = y, HO = x, 5/y = x/4, y = 20/x

$$\begin{cases} x^2 + 25 = r^2 \\ y^2 + 16 = r^2 \end{cases}$$

x^2 – y^2 +9 = 0

x^2 – 400/x^2 + 9 = 0

x^4 +9*x^2 – 400 = 0

x^2 = t, t≥ 0

t^2 + 9*t – 400 = 0

D = b^2 – 4*a*c

t1 =(-b + (D)^0.5)/2*a

t2 =(-b - (D)^0.5)/2*a

D = 1681

t1 = 16

t2 = -25

$\begin{cases} t1 = 16, t = -25 \\ t \geq 0 \end{cases}$, t = 16

16 = x^2

x = ±4(We take a positive value, because there are no negative lengths in geometry)

y = 20/4 = 5

r = AO = ((AH)^2 + (HO)^2)^0.5 = (16 + 25)^0.5 = 6.4.

Answer: r = 6.4.