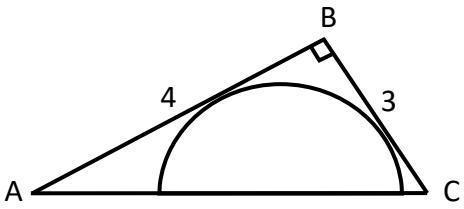
GEOMETRY EXAMPLE 4

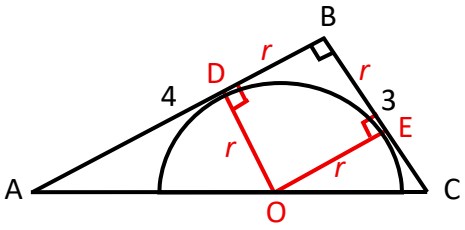
In ΔABC, AB = 4 cm, BC = 3 cm and $\angle B = 90^0$.
A semicircle with centre on AC touches AB and BC.
What is the radius of the semicircle?



(A) $\sqrt{2}$ (B) $\frac{5}{3}$ (C) $\frac{12}{7}$ (D) $\sqrt{3}$

SOLUTION

Mark two radii, OD and OE, at points of contact.



$\therefore ODBE$ is a square

and $\frac{OD}{DA} = \frac{CB}{BA}$

$(= \tan A$, or ratios of corresponding angles of similar $\Delta s\ ODA, CBA)$

$$\therefore \frac{r}{4-r} = \frac{3}{4}$$

$$\text{so } 4r = 12 - 3r$$

$$\therefore r = \frac{12}{7}$$

So, the correct answer is C.