

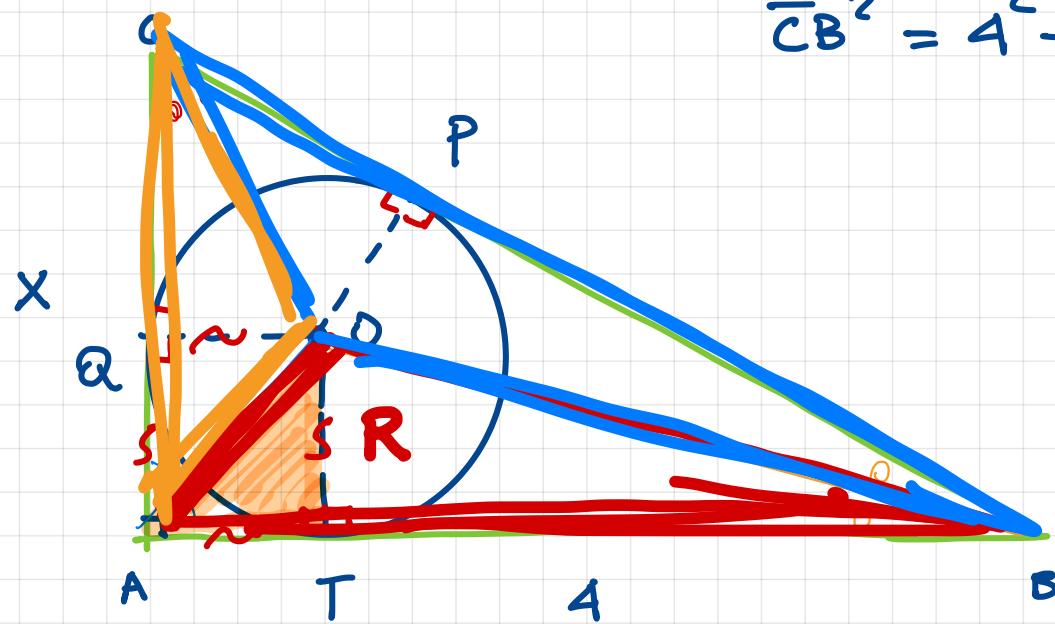
PROBLEMI CON I LIMITI



M5014

Determina il limite a cui tende la misura del raggio della circonferenza inscritta in un triangolo rettangolo con i cateti di misura 4 e x , quando x tende a $+\infty$. [2]

$$\overline{CB}^2 = 4^2 + x^2$$



ARe A $\Delta_{ACB} = \frac{\overline{AB} \cdot \overline{AC}}{2} = \Delta_{AOB} + \Delta_{CPO} + \Delta_{CAD}$

$$\frac{\overline{AB} \cdot R}{2} + \frac{\overline{CB} \cdot R}{2} + \frac{\overline{CA} \cdot R}{2}$$

$$\frac{4 \cdot x}{z} \leq \frac{4 \cdot R}{z} + \sqrt{\frac{16+x^2}{z}} R + \frac{x \cdot R}{z}$$

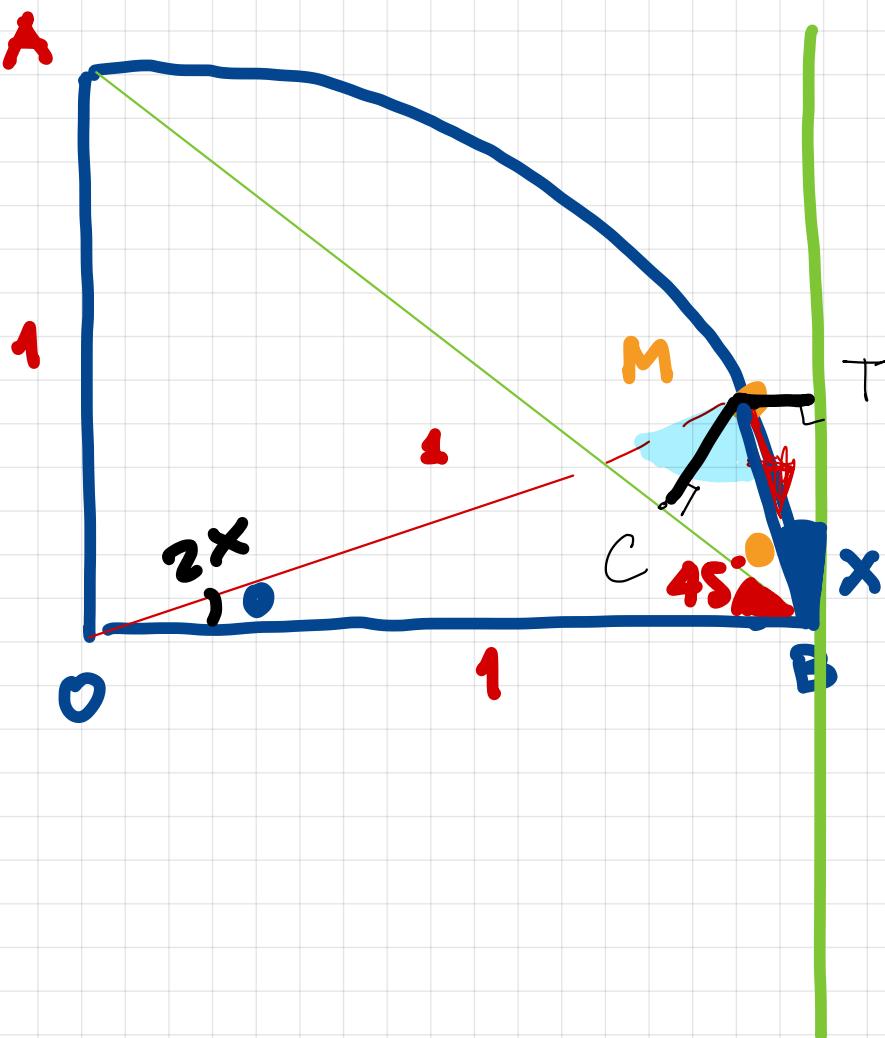
$$zx = \frac{R}{z} (4 + \sqrt{16+x^2} + x)$$

$$R = \frac{4x}{(4 + \sqrt{16+x^2} + x)}$$

$$\lim_{x \rightarrow \infty} \frac{4x}{(4 + \sqrt{16+x^2} + x)} = \lim_{x \rightarrow \infty} \frac{\cancel{4x}}{x \left(\frac{4}{x} + \sqrt{\frac{16}{x^2} + 1} + 1 \right)}$$

$\cancel{4x}$
↓ 0 ↓ 1 ↓ 1 ↓ 1

$= 2$



$$= 180^\circ - 180^\circ + 2x = 2x$$

In un quarto di circonferenza di estremi A, B e raggio $r = 1$, traccia la tangente t passante per B e la corda AB . Considera un punto M appartenente all'arco AB e, dette T e C le sue proiezioni ortogonali sulla tangente t e sulla corda AB , calcola il limite:

$$\lim_{M \rightarrow B} \frac{\overline{MT}}{\overline{MC}}.$$

[0]

$$\overline{AB} = \sqrt{2}$$

$$\overline{OM} = 1$$

$$\overline{BH}$$

$$\bullet = 45^\circ - x$$

$$90^\circ - x - 45^\circ$$

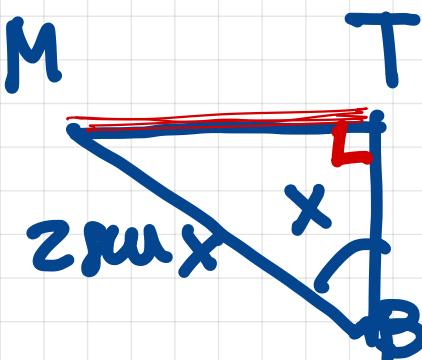
$$\begin{aligned} \textcolor{cyan}{\angle} &= \widehat{OMB} = 45^\circ + (45^\circ - x) \\ &= 90^\circ - x \end{aligned}$$

$$\bullet = 180^\circ - 2(90^\circ - x)$$

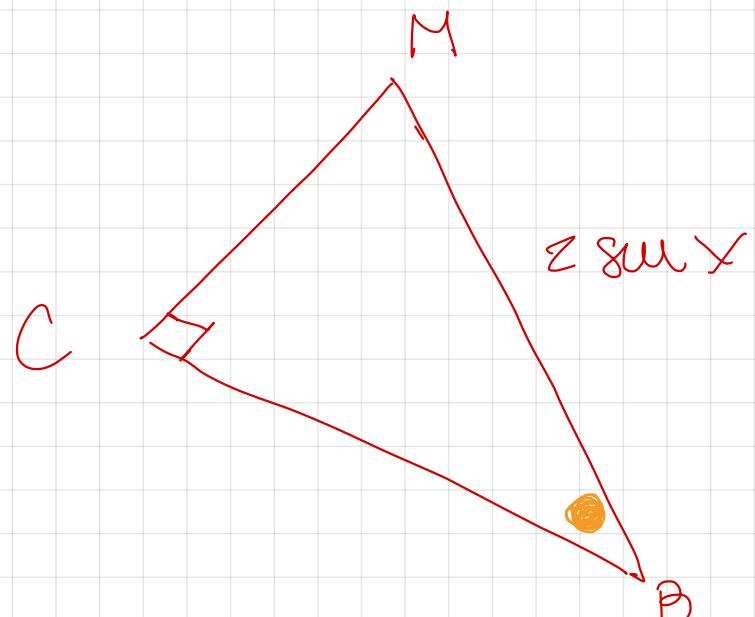
$$\overline{MB} = 2R \cdot \sin x$$

perché x è angolo al centro.

$$\overline{MB} = 2 \sin x$$



$$\begin{aligned}\overline{MT} &= 2 \sin x \cdot \sin x \\ &= 2 \sin^2 x\end{aligned}$$



$$\lim_{x \rightarrow 0} \frac{2 \sin x}{\sqrt{2} \sin x (\cos x - \sin x)} \Rightarrow \frac{2}{\sqrt{2}} \cdot 0 = 0$$

$$\overline{MC} = 2 \sin x \cdot \sin (45^\circ - x)$$

$$= 2 \sin x (\sin 45 \cos x - \sin x \cos 45)$$

$$(\frac{\sqrt{2}}{2} \sin x \cos x - \frac{\sqrt{2}}{2} \sin^2 x)$$

$$= \sqrt{2} \sin x (\cos x - \sin x)$$

$$\Rightarrow \frac{2}{\sqrt{2}} \cdot 0 = 0$$