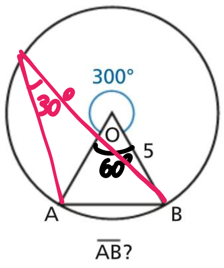
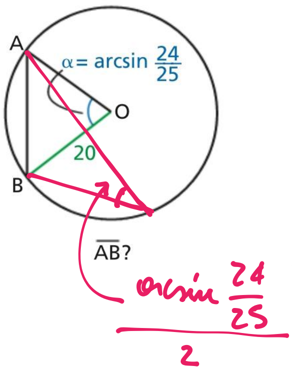
5/12/2018

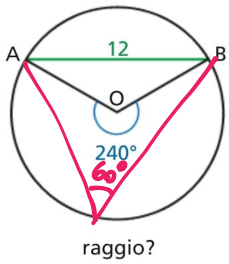
162 (1)



(2)



(3)



[5; 24; $4\sqrt{3}$]

(1) $\overline{AB} = 2r\sin\alpha =$

$= 10\cdot\sin 30° = 10\cdot\frac{1}{2} =$

$= 5$

(2) $\overline{AB} = 40\cdot\sin\frac{\alpha}{2} = 40\cdot\sqrt{\frac{1-\cos\alpha}{2}} = 40\cdot\sqrt{\frac{1-\frac{7}{25}}{2}} = 40\sqrt{\frac{9}{25}} = 40\cdot\frac{3}{5} = \boxed{24}$

$\cos\left(\arcsin\frac{24}{25}\right) = \sqrt{1-\sin^2\left(\arcsin\frac{24}{25}\right)} = \sqrt{1-\left(\frac{24}{25}\right)^2} =$

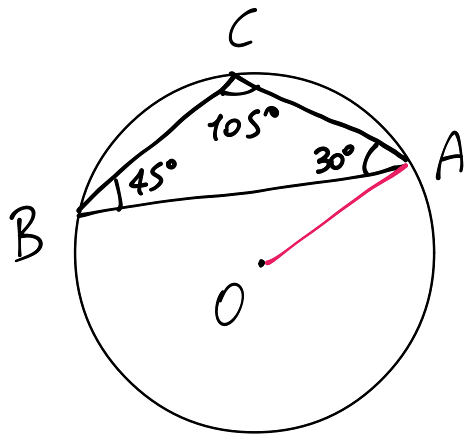
$= \sqrt{1-\frac{576}{625}} = \sqrt{\frac{625-576}{625}} = \sqrt{\frac{49}{625}} = \frac{7}{25}$

(3) $\overline{AB} = 2r\cdot\sin 60°$

$12 = \cancel{2}r\cdot\frac{\sqrt{3}}{\cancel{2}} \Rightarrow r = \frac{12}{\sqrt{3}}\cdot\frac{\sqrt{3}}{\sqrt{3}} = \boxed{4\sqrt{3}}$

169 Sia ABC un triangolo inscritto in una circonferenza. Determina la misura del raggio, sapendo che la corda BC misura $12l$ e gli angoli $\widehat{B}$ e $\widehat{C}$ misurano rispettivamente 45° e 105°. Trova poi il perimetro del triangolo.

$[r = 12l; 6l(\sqrt{6} + 2 + 3\sqrt{2})]$



$\overline{BC} = 12l$

$\overline{BC} = 2r \sin 30°$

$12l = \cancel{2}r \cdot \frac{1}{\cancel{2}} \Rightarrow r = 12l$

$$\overline{AB} = 2r \cdot \sin 105° = 2 \cdot 12l \cdot \sin(60° + 45°) = 24l\left[\sin 60° \cos 45° + \right.$$

$$\left. + \sin 45° \cdot \cos 60°\right] = \overset{6}{\cancel{24}}l\left[\frac{\sqrt{3}}{\cancel{2}} \cdot \frac{\sqrt{2}}{\cancel{2}} + \frac{\sqrt{2}}{\cancel{2}} \cdot \frac{1}{\cancel{2}}\right] = 6l(\sqrt{6} + \sqrt{2})$$

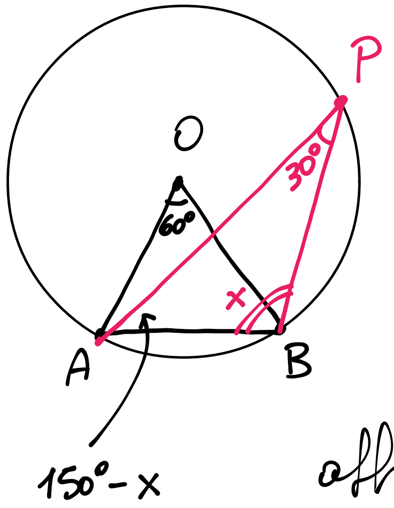
$$\overline{AC} = 2r \cdot \sin 45° = \cancel{2} \cdot 12l \cdot \frac{\sqrt{2}}{\cancel{2}} = 12\sqrt{2}\,l$$

$$2p = 12l + 12\sqrt{2}\,l + 6l(\sqrt{6} + \sqrt{2}) =$$

$$= 6l(2 + 2\sqrt{2} + \sqrt{6} + \sqrt{2}) = \boxed{6l(2 + 3\sqrt{2} + \sqrt{6})}$$

174 Considera una circonferenza di raggio r e una sua corda $\overline{AB} = r$. Sul maggiore dei due archi $\widehat{AB}$ prendi un punto P e poni $P\hat{B}A = x$. Determina $\overline{BP}$ in funzione di x e trova per quali valori di x si ha $\overline{BP} = r\sqrt{2}$.

$\left[\overline{BP} = 2r\sin\left(\frac{5}{6}\pi - x\right); x = \frac{\pi}{12} \vee x = \frac{7}{12}\pi\right]$



$$\overline{BP} = 2r\sin(150° - x)$$

$\Downarrow$ IN RADIANTI

$$\overline{BP} = 2r\sin\left(\frac{5}{6}\pi - x\right)$$

affinché il problema abbia senso deve essere

$$\begin{cases} x > 0° \\ 150° - x > 0° \end{cases} \Rightarrow 0° < x < 150°$$

$\Downarrow$

$$\boxed{0 < x < \frac{5}{6}\pi} \quad \text{C.E.}$$

$$\overline{BP} = r\sqrt{2}$$

$$2\cancel{r}\sin\left(\frac{5}{6}\pi - x\right) = \cancel{r}\sqrt{2}$$

$$\sin\left(\frac{5}{6}\pi - x\right) = \frac{\sqrt{2}}{2}$$

$$\frac{5}{6}\pi - x = \frac{\pi}{4} \quad \vee \quad \frac{5}{6}\pi - x = \pi - \frac{\pi}{4}$$

$$x = \frac{5}{6}\pi - \frac{\pi}{4} \quad \vee \quad x = \frac{5}{6}\pi - \pi + \frac{\pi}{4}$$

$$x = \frac{10\pi - 3\pi}{12} \quad \vee \quad x = \frac{10\pi - 12\pi + 3\pi}{12}$$

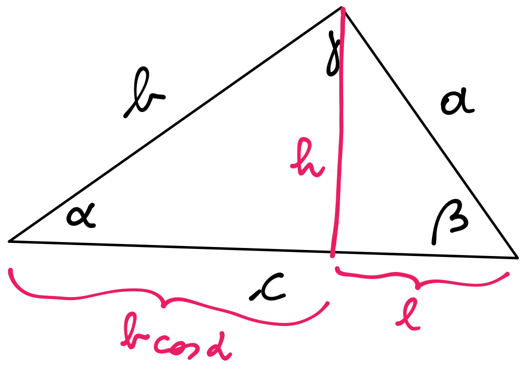
$$\boxed{x = \frac{7}{12}\pi \quad \vee \quad x = \frac{\pi}{12}}$$

ACCETTABILI!!

TEOREMA DEL COSENO (DI CARNOT)

↓

GENERALIZZAZIONE DEL TEOREMA DI PITAGORA (PER TRIANGOLI QUALSIASI)



$$a^2 = b^2 + c^2 - 2bc\cos\alpha$$

DIMOSTRAZIONE

$$a^2 = h^2 + \ell^2 = (b\sin\alpha)^2 + (c - b\cos\alpha)^2 =$$

$$= b^2\sin^2\alpha + c^2 + b^2\cos^2\alpha - 2bc\cos\alpha =$$

$$= b^2\underbrace{(\sin^2\alpha + \cos^2\alpha)}_{1} + c^2 - 2bc\cos\alpha =$$

$$= b^2 + c^2 - 2bc\cos\alpha$$