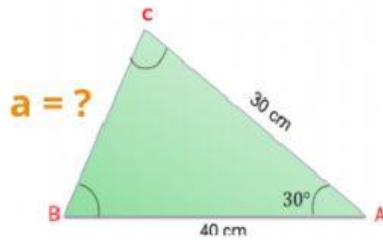


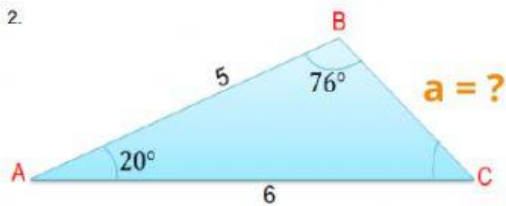


ARRASTRA EL RECUADRO CON LA FÓRMULA CORRECTA

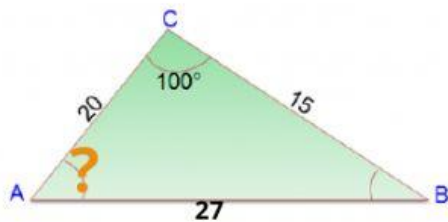
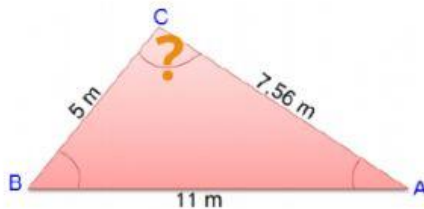
PARA HALLAR EL LADO DESCONOCIDO



2.



PARA HALLAR EL ÁNGULO DESCONOCIDO



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

$$A = \cos^{-1} \left[\frac{b^2 + c^2 - a^2}{2bc} \right]$$

$$\frac{a}{\sin A} = \frac{b}{\sin B}$$

$$C = \cos^{-1} \left[\frac{a^2 + b^2 - c^2}{2ab} \right]$$



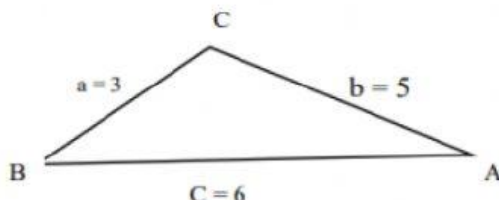
La ley de coseno es muy útil para resolver triángulos oblicuángulos cuando se conocen:

caso 1	LLL. Los tres lados.
caso 2	LAL. Dos lados y el ángulo comprendido.

Caso 1 (LLL. Cuando se conocen los tres lados).

Datos:

Lados	Ángulos
a = 3	A = ?
b = 5	B = ?
c = 6	C = ?



Fórmulas despejadas:

$$A = \cos^{-1}\left(\frac{b^2 + c^2 - a^2}{2bc}\right), \quad B = \cos^{-1}\left(\frac{a^2 + c^2 - b^2}{2ac}\right), \quad C = \cos^{-1}\left(\frac{a^2 + b^2 - c^2}{2ab}\right), \quad A + B + C = 180^\circ$$

-Primero encontraremos el ángulo A.

$$A = \cos^{-1}\left(\frac{5^2 + 6^2 - 3^2}{2(5)(6)}\right) = \cos^{-1}\left(\frac{25 + 36 - 9}{60}\right) = \cos^{-1}\left(\frac{52}{60}\right) = \cos^{-1}\left(\frac{13}{15}\right) \Rightarrow A = 28.1^\circ$$

-Segundo encontraremos el ángulo B.

$$B = \cos^{-1}\left(\frac{3^2 + 6^2 - 5^2}{2(3)(6)}\right) = \cos^{-1}\left(\frac{9 + 36 - 25}{36}\right) = \cos^{-1}\left(\frac{20}{36}\right) = \cos^{-1}\left(\frac{5}{9}\right) \Rightarrow B = 56.2^\circ$$

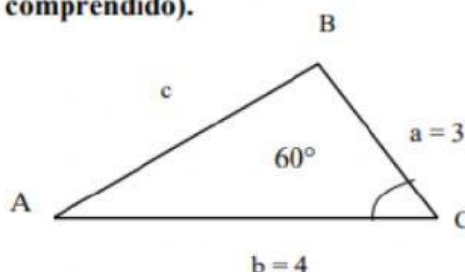
-Tercero encontraremos el ángulo C.

$$A + B + C = 180^\circ \quad C = 180^\circ - A - B \Rightarrow C = 180^\circ - 28.1^\circ - 56.2^\circ = 95.7^\circ$$

Caso 2 (LAL. Dos lados y el ángulo comprendido).

Datos:

Lados	Ángulos
a = 3	A = ?
b = 4	B = ?
c = ?	C = 60°



Fórmulas

$$c^2 = a^2 + b^2 - 2ab \cos C, \quad B = \cos^{-1}\left(\frac{a^2 + c^2 - b^2}{2ac}\right), \quad A + B + C = 180^\circ$$

-Primero encontraremos c.

$$c^2 = 3^2 + 4^2 - 2(3)(4) \cos 60^\circ, \quad c^2 = 9 + 16 - 24\left(\frac{1}{2}\right), \quad c^2 = 25 - 12, \quad c^2 = 13 \Rightarrow c = \sqrt{13}$$

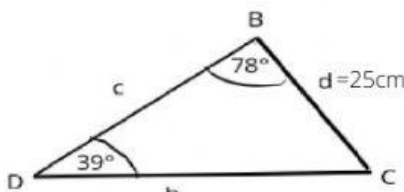
-Segundo encontraremos "B".

$$B = \cos^{-1}\left(\frac{3^2 + (\sqrt{13})^2 - 4^2}{2(3)(\sqrt{13})}\right) = \cos^{-1}\left(\frac{9 + 13 - 16}{6\sqrt{13}}\right) = \cos^{-1}\left(\frac{6}{6\sqrt{13}}\right) = \cos^{-1}\left(\frac{1}{\sqrt{13}}\right) \Rightarrow B = 82.8^\circ$$

-Tercero encontraremos A.

$$A + B + C = 180^\circ, \quad A = 180^\circ - B - C, \quad A = 180^\circ - 82.8^\circ - 60^\circ = 37.2^\circ$$

- Resolver los siguientes triángulos que muestran cada figura, calcular el área y el perímetro.

	DATOS $d=25\text{cm}$ $D=39^\circ$ $B=78^\circ$	INCOGNITAS $C=?$ $b=?$ $c=?$ $P=?$ $A=?$
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Solución

Calculamos C: $B + C + D = 180^\circ \Rightarrow C = 180^\circ - (B + D) \Rightarrow C = 180^\circ - (78^\circ + 39^\circ) \Rightarrow C = 63^\circ$

Calculamos b: $\frac{b}{\sin B} = \frac{d}{\sin D} \Rightarrow b = \frac{d \sin B}{\sin D} = \frac{25\text{cm} \times \sin 78^\circ}{\sin 39^\circ} \Rightarrow b = 38.86\text{cm}$

Calculamos c: $\frac{c}{\sin C} = \frac{d}{\sin D} \Rightarrow c = \frac{d \sin C}{\sin D} = \frac{25\text{cm} \times \sin 63^\circ}{\sin 39^\circ} \Rightarrow c = 35.40\text{cm}$

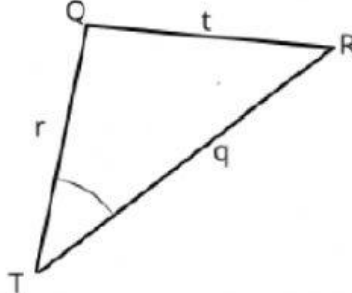
Calculamos P: $P = d + b + c \Rightarrow P = 25\text{cm} + 38.86\text{cm} + 35.40\text{cm} \Rightarrow P = 99.26\text{cm}$

Calculamos A: $A = \frac{b c \sin D}{2} = \frac{38.86\text{cm} \times 35.40\text{cm} \times \sin 39^\circ}{2} \Rightarrow A = 440.5\text{cm}^2$

Acti
Ve a



- Resolver los siguientes triángulos que muestran cada figura, calcular el área y el perímetro.

	DATOS $r=2.6m$ $T=38^{\circ}16'$ $q=3.8m$	INCOGNITAS $t=?$ $R=?$ $Q=?$ $P=?$ $A=?$
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Solucion

Calculamos t: $t^2 = q^2 + r^2 - 2qr \cos T \Rightarrow t = \sqrt{3.8^2 + 2.6^2 - 2 \cdot 3.8 \cdot 2.6 \cdot \cos 38^{\circ}16'} \Rightarrow t = \underline{\hspace{1cm}} m$

Calculamos R: $\frac{r}{\sin R} = \frac{t}{\sin T} \Rightarrow \sin R = \frac{r \sin T}{t} \Rightarrow R = \sin^{-1} \frac{2.6 \sin 38^{\circ}16'}{\underline{\hspace{1cm}}} \Rightarrow R = \underline{\hspace{1cm}}^{\circ} \underline{\hspace{1cm}}' \underline{\hspace{1cm}}''$

Calculamos Q: $Q + T + R = 180^{\circ} - (T + R) = 180^{\circ} - (38^{\circ}16' + 42^{\circ}34'34'') \Rightarrow Q = \underline{\hspace{1cm}}^{\circ} \underline{\hspace{1cm}}' \underline{\hspace{1cm}}''$

Calculamos P: $P = q + r + t = 3.8m + 2.6m + 2.38m \Rightarrow P = \underline{\hspace{1cm}} m$

Calculamos A: $A = \frac{q \cdot r \cdot \sin T}{2} = \frac{3.8m \cdot \underline{\hspace{1cm}} m \cdot \sin 38^{\circ}16'}{2} \Rightarrow A = \underline{\hspace{1cm}} m^2$

Act