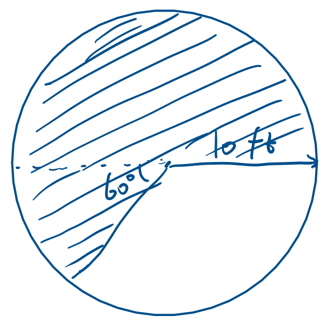
eg. Find the area of the sector below:



Sol: $180° + 60° = 240°$

$$A = \pi r^2 \cdot \frac{\theta}{360°}$$

$$A = \pi \cdot 10^2 \cdot \frac{240°}{360°}$$

$$= \pi \cdot 100 \cdot \frac{2}{3}$$

$$\approx \boxed{209.44} \ ft^2$$

$$\frac{\cancel{240°}^{\,2}}{\cancel{360°}_{\,3}}$$

Eg. Find the area of a sector of a circle has a central angle of $\frac{5\pi}{6}$ and a radius of 20 cm.

Sol:

$$A = \pi r^2 \cdot \frac{\theta}{2\pi}, \quad \theta = \frac{5\pi}{6}, \quad r = 20$$

$$A = \pi \cdot 20^2 \cdot \frac{\frac{5\pi}{6}}{2\pi}$$

$$= \pi \cdot 400 \cdot \frac{5}{12}$$

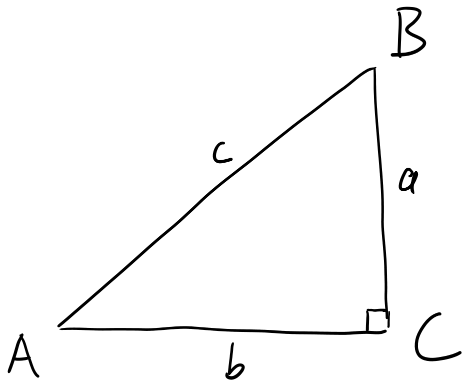
$$\approx \boxed{523.60} \ cm^2$$

$$\frac{5\cancel{\pi}}{6} \cdot \frac{1}{2\cancel{\pi}}$$

$$\leftarrow \frac{5}{12}$$

IV. Trignometric Function

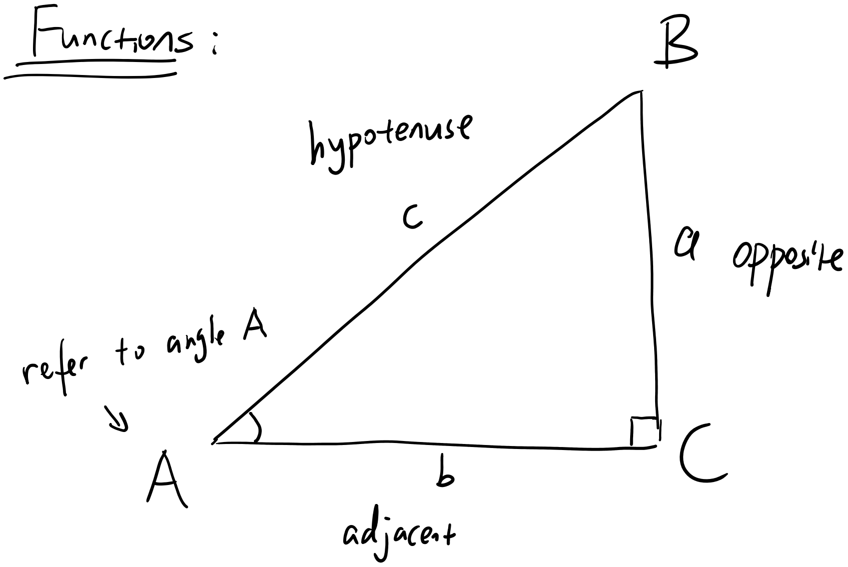
B

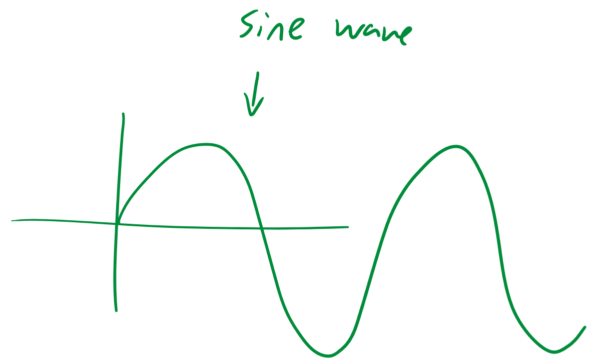


Right - Triangle

Pythagorean Thm: $a^2 + b^2 = c^2$

Functions:





$\sin A = \frac{a}{c} \leftarrow \frac{\text{"opposite"}}{\text{hypotenuse}}$

$\cos A = \frac{b}{c} \leftarrow \frac{\text{"adjacent"}}{\text{hypotenuse}}$

$\tan A = \frac{a}{b} \leftarrow \frac{\text{"opposite"}}{\text{adjacent}}$

Sine

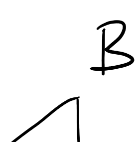
Cosine

tangent

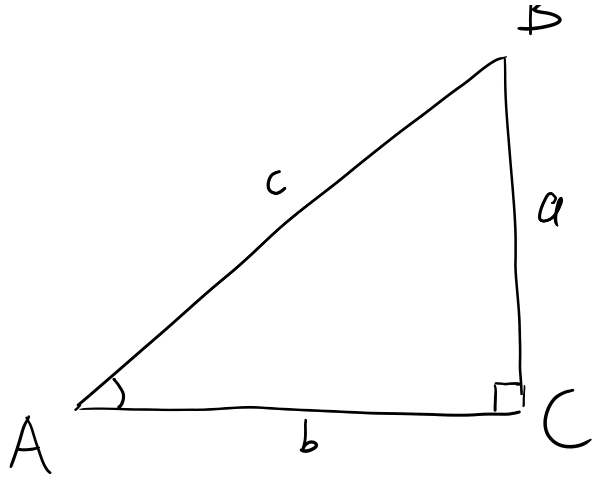
SOH - CAH - TOA

may be helpful!

Similarly,



Similarly,

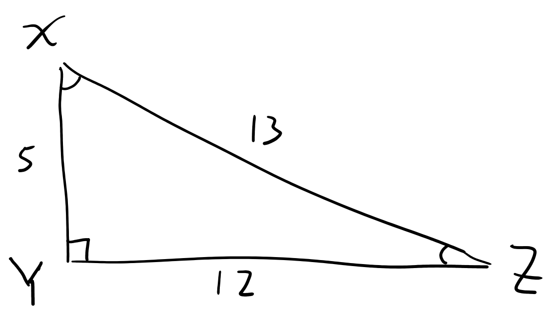


$\sin B = \frac{b}{c} \leftarrow$ "$\frac{\text{opposite}}{\text{hypotenuse}}$"

$\cos B = \frac{a}{c} \leftarrow$ "$\frac{\text{adjacent}}{\text{hypotenuse}}$"

$\tan B = \frac{b}{a} \leftarrow$ "$\frac{\text{opposite}}{\text{adjacent}}$"

eg. Given



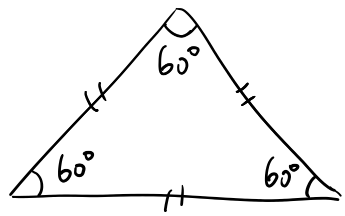
Then, we have

$\sin X = \boxed{\frac{12}{13}}$, $\sin Z = \boxed{\frac{5}{13}}$

$\cos X = \boxed{\frac{5}{13}}$, $\cos Z = \boxed{\frac{12}{13}}$

$\tan X = \boxed{\frac{12}{5}}$, $\tan Z = \boxed{\frac{5}{12}}$

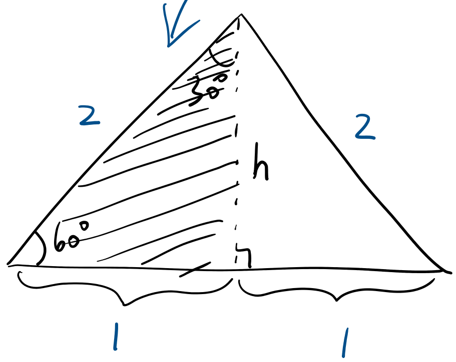
Now, <u>equilateral triangle</u> — all 3 sides are equal, and each angle is $60°$.



all sides are same

each angle is $60°$

Now,



$$\Longleftrightarrow \quad 1^2 + h^2 = 2^2$$

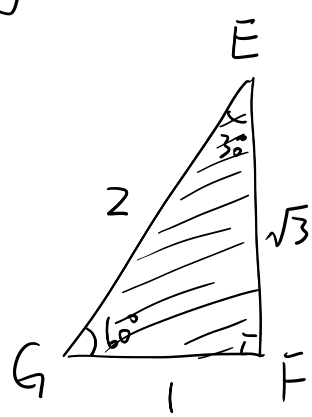
$$1 + h^2 = 4$$
$$-1 \qquad\quad -1$$

$$h^2 = 3$$

$$\sqrt{h^2} = \sqrt{3}$$

$$h = \pm\sqrt{3}$$

$$h = \sqrt{3}$$



$$\sin 30° = \frac{1}{2}$$

$$\sin 60° = \frac{\sqrt{3}}{2}$$