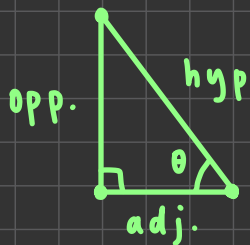
CHAPTERS 7 & 8

trigonometry

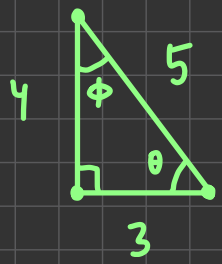
OF A RIGHT TRIANGLE

trigonometry



hyp = hypotenuse
opp = opposite (side)
adj = adjacent (side)

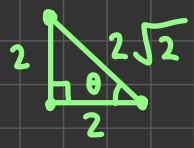
TANGENT: $\tan(\theta) = \frac{\text{opp.}}{\text{adj.}}$, $\tan^{-1}\left(\frac{\text{opp.}}{\text{adj.}}\right) = \theta$



$\tan(\theta) = \frac{4}{3}$, $\tan^{-1}\left(\frac{4}{3}\right) = \theta$

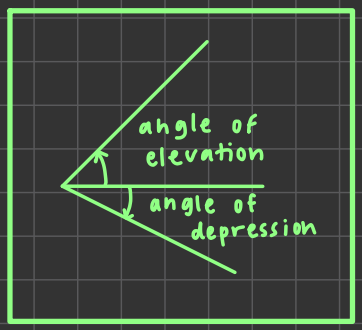
$\tan(\phi) = \frac{3}{4}$, $\tan^{-1}\left(\frac{3}{4}\right) = \phi$

SINE: $\sin(\theta) = \frac{\text{opp.}}{\text{hyp.}}$, $\sin^{-1}\left(\frac{\text{opp.}}{\text{hyp.}}\right) = \theta$

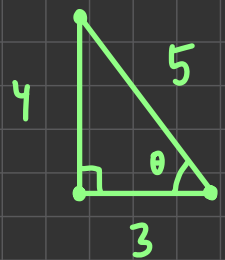


$\sin(\theta) = \frac{2}{2\sqrt{2}} = \frac{1}{\sqrt{2}} = \frac{\sqrt{2}}{2}$

$\sin^{-1}\left(\frac{\sqrt{2}}{2}\right) = \theta$



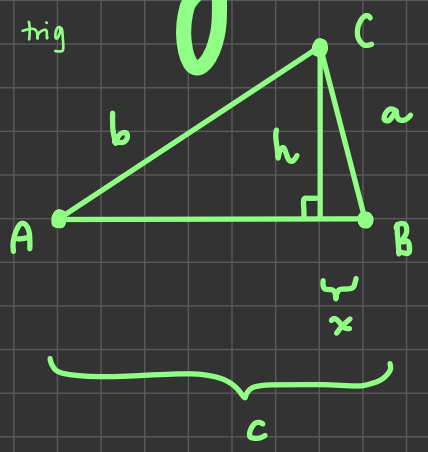
COSINE: $\cos(\theta) = \frac{\text{adj.}}{\text{hyp.}}$, $\cos^{-1}\left(\frac{\text{adj.}}{\text{hyp.}}\right) = \theta$



$\cos(\theta) = \frac{3}{5}$, $\cos^{-1}\left(\frac{3}{5}\right) = \theta$

trig WITH ACUTE TRIANGLES

trig



$\sin\angle A = \frac{h}{b}$ $\quad \sin\angle B = \frac{h}{a}$

$b\sin\angle A = h$ $\quad h = a\sin\angle B$

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

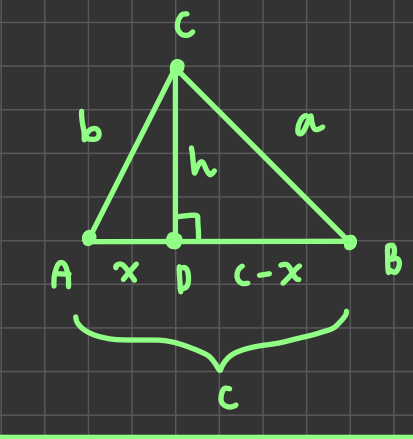
$$\frac{\sin\angle A}{a} = \frac{\sin\angle B}{b}$$

same for ↴

$$\frac{\sin\angle A}{a}, \frac{\sin\angle B}{b}, \frac{\sin\angle C}{c}$$

sine LAW:

$$\frac{\sin\angle A}{a} = \frac{\sin\angle B}{b} = \frac{\sin\angle C}{c}$$



$\cos\angle A = \frac{x}{b}$, $b\cos\angle A = x$

$b^2 = x^2 + h^2$

$a^2 = (c-x)^2 + h^2$

$a^2 = c^2 - 2xc + x^2 + h^2$

$a^2 = b^2 + c^2 - 2(b\cos\angle A)c$

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

cosine LAW:

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