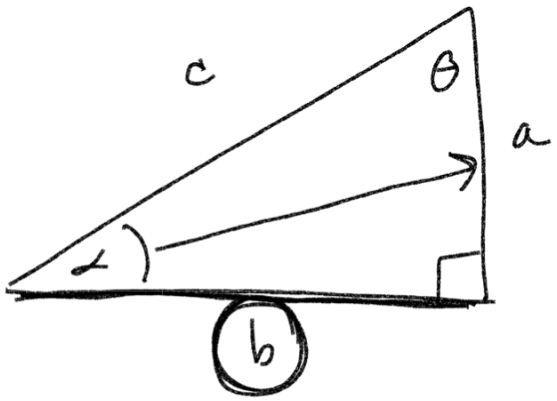
M-GP General Physics Week 13 12/12

Fission → energy is released from bonds breaking — Bomb

Fusion → energy is released from bonds forming — Sun

SOH CAH TOA

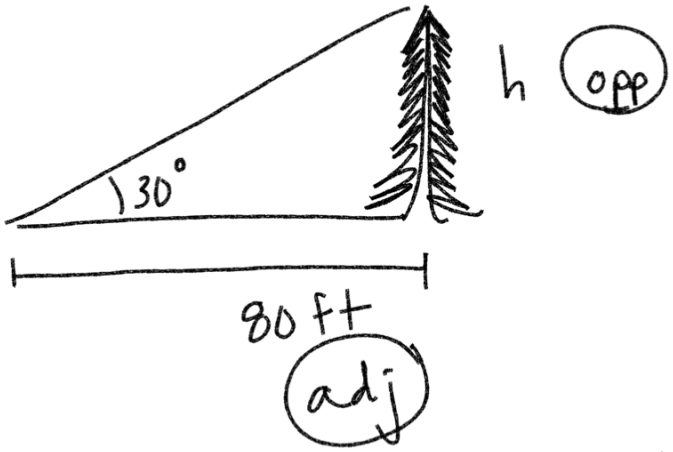


$$\sin\theta = \frac{opp}{hyp} = \frac{b}{c}$$

$$\cos\theta = \frac{adj}{hyp} = \frac{a}{c}$$

$$\sin\alpha = \frac{opp}{hyp} = \frac{a}{c}$$

$$\tan\alpha = \frac{opp}{adj} = \frac{a}{b}$$

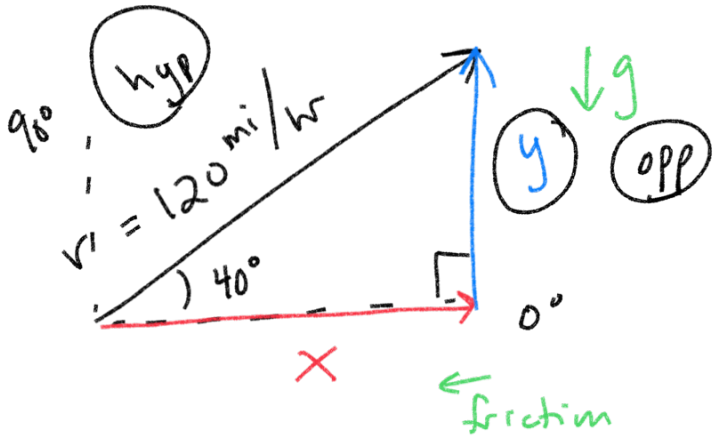


$$\tan\theta = \frac{opp}{adj}$$

$$80(\tan 30^\circ) = \left(\frac{h}{80}\right)80$$

$$h = 80(\tan 30^\circ) = \boxed{46.2 \text{ ft}}$$

SOH CAH TOA



$\sin\theta = \frac{opp}{hyp}$

$120(\sin 40^\circ) = \left(\frac{y}{120}\right)120$

$y = 120(\sin 40^\circ)$

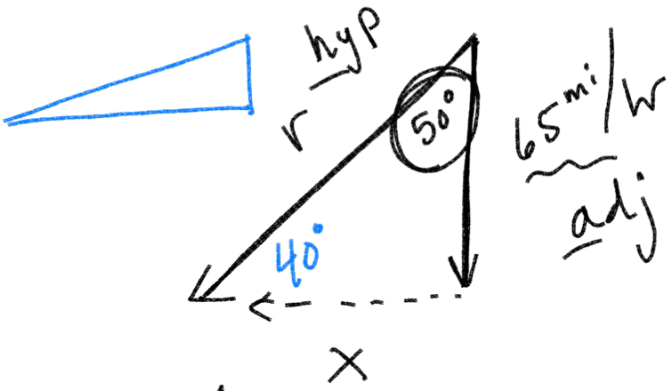
$y = r\sin\theta$

$= 77.1 \text{ mi/hr}$

$X = r\cos\theta$

$X = 120(\cos 40^\circ)$

$= 91.9 \text{ mi/hr}$



$65(\tan 50^\circ) = \left(\frac{X}{65}\right)65$

$X = 65(\tan 50^\circ)$

$X = 77.5 \text{ mi/hr}$

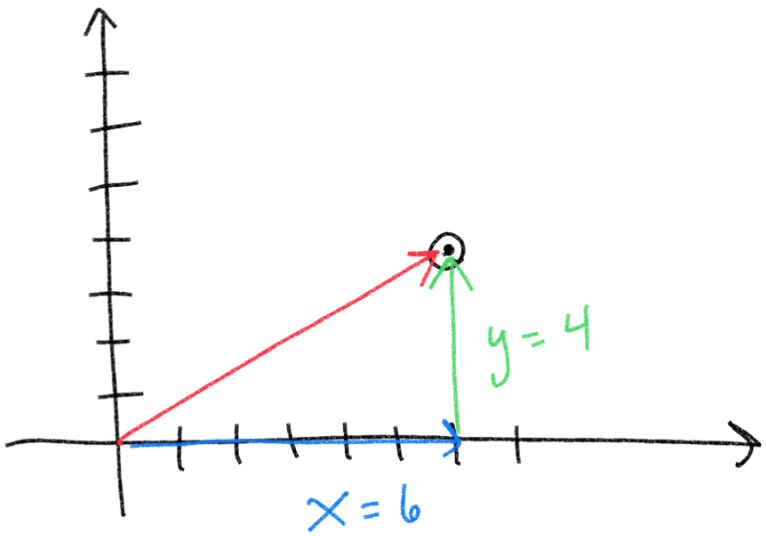
SOH CAH TOA

opp

$4 = \frac{12}{3}$ $\quad 3 = \frac{12}{4}$

$\cos 50 = \frac{65}{r}$

$r = \frac{65}{\cos 50} = 101.1 \text{ mi/hr}$



(6, 4)

Rectangular

↓

polar

(r, θ)

$$r = \sqrt{x^2 + y^2}$$

$$\sqrt{(6)^2 + (4)^2} = \sqrt{36+16} = \sqrt{52} = \sqrt{4}\sqrt{13}$$

$2\sqrt{13}$

$$\theta = \tan^{-1}\left(\frac{y}{x}\right) = \tan^{-1}\left(\frac{4}{6}\right)$$

$$= 33.7°$$

$(2\sqrt{13}, 33.7°)$

Polar Coordinates → Rectangular

$(12, 40°)$ (r, θ)

$$x = r\cos\theta$$

$$= 12\cos 40° = 9.2$$

$$y = r\sin\theta$$

$$= 12\sin 40 = 7.7$$

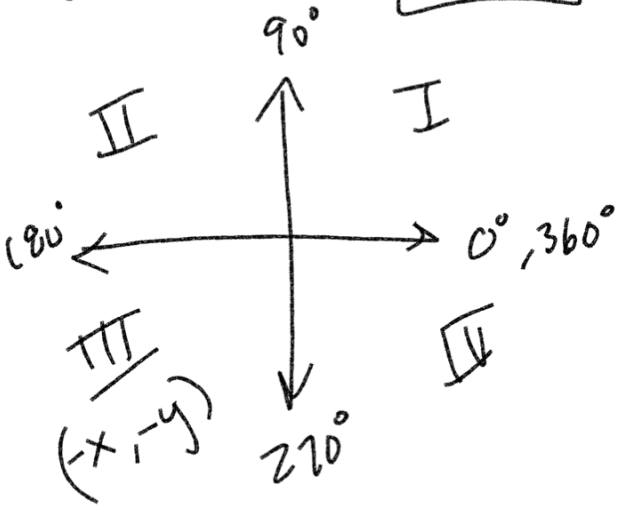
Polar $(8, 210°) \longrightarrow$ Rectangular

$x = r\cos\theta$

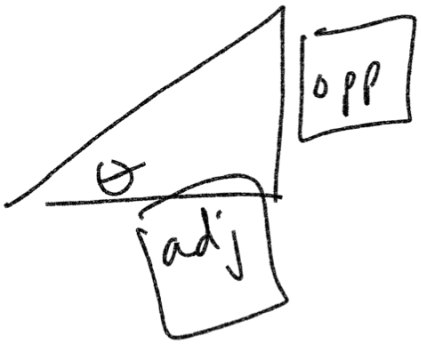
$8(\cos 210°) = \boxed{-6.9}$

$y = r\sin\theta$

$= 8(\sin 210) = \boxed{-4}$



$\boxed{(-6.9, -4)}$



$\boxed{\tan\theta} = \frac{opp}{adj}$

tan → ratio of sides

θ is an angle

$\tan^{-1}\left(\frac{opp}{adj}\right) = \theta$