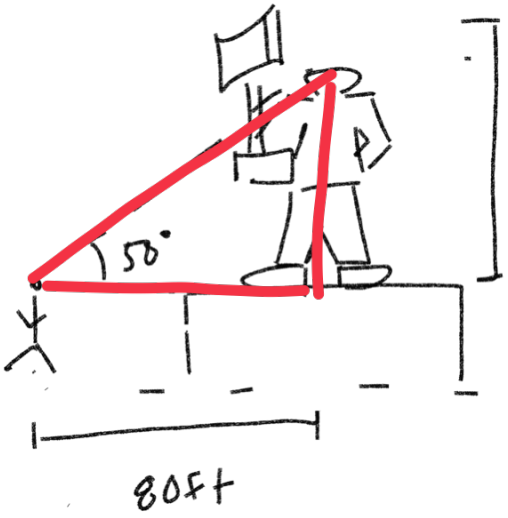


Nate is infinitely afraid of the Bungee. Given the diagram, how tall is the Bungee

SOH CAH TOA

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

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

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

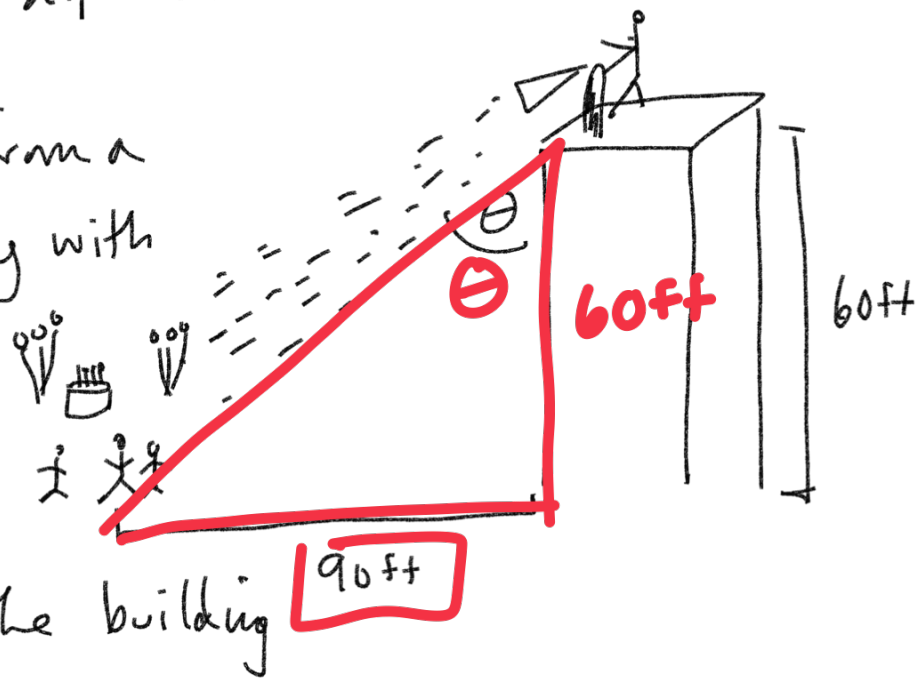
$\tan\theta = \frac{opp}{adj}$

$80(\tan 50^\circ) = \left(\frac{h}{80}\right)80$

$h = 80(\tan 50^\circ) = \boxed{95.3\text{ft}}$

Nate is spreading birthday joy with his funfetti dip n' dot cannon.

If he rains joy from a 60ft tall building with children a safe distance of 90ft away, what is the angle of the cannon from the building



$\tan\theta = \frac{opp}{adj}$ $\tan\theta = \frac{90}{60}$

$\theta = \tan^{-1}\left(\frac{90}{60}\right) = 56.3°$

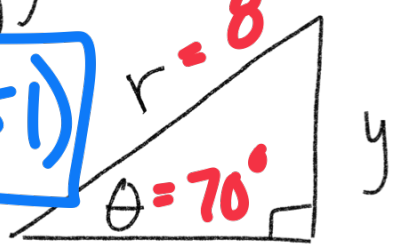
Polar Coordinates → Regular Coordinates

(r, θ)

$(8, 70°)$

(x, y)

$(2.73, 7.51)$



$x = r\cos\theta$ $y = r\sin\theta$

$x = 8\cos 70$ $y = 8\sin 70$

$x = 2.73$ $y = 7.51$

$\cos\theta = \frac{x}{r}$

$x = r\cos\theta$

Polar Coordinate → Rectangular

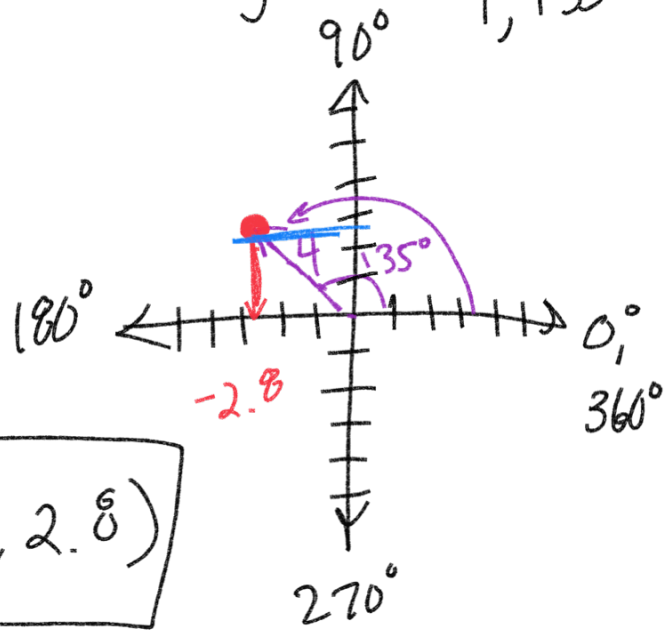
$(4, 135°) \longrightarrow (x, y)$

r θ
4, 135°

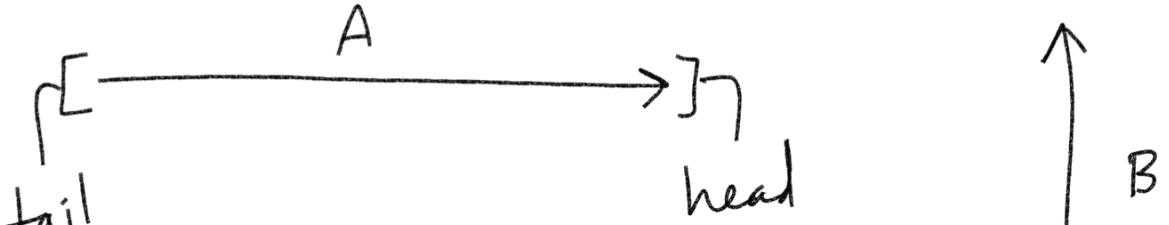
$x = r\cos\theta$

$4\cos(135) = -2.8$

$y = 4\sin 135° = 2.8$

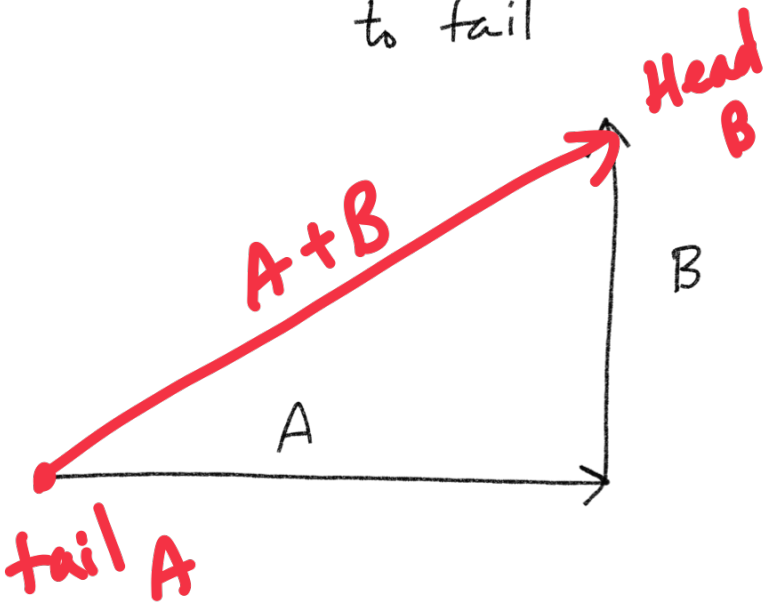


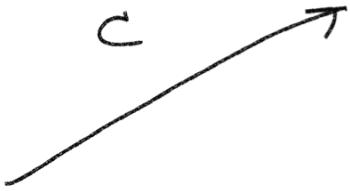
$(-2.8, 2.8)$



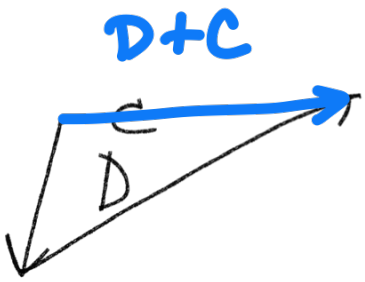
A + B

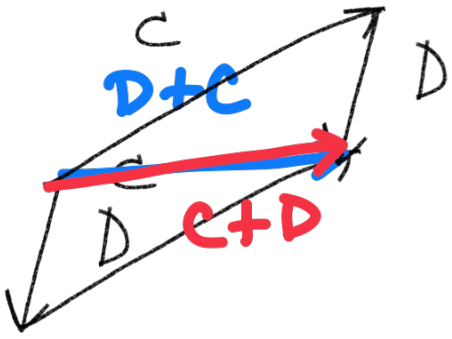
Add from head to tail





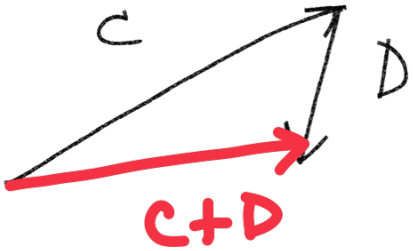
D + C

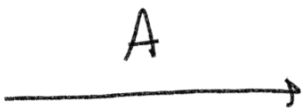


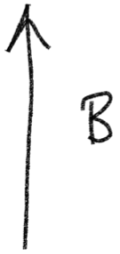


C + D

D + C = C + D



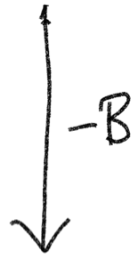


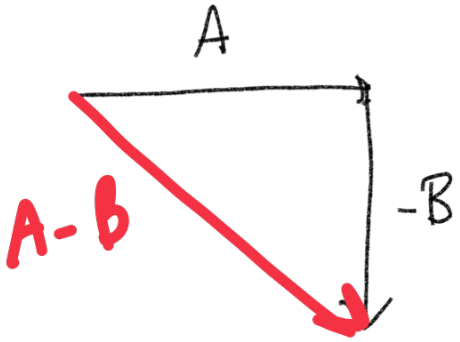


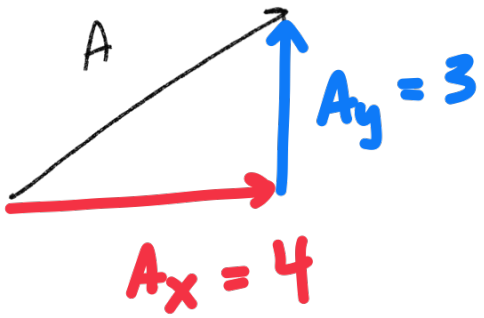
A - B

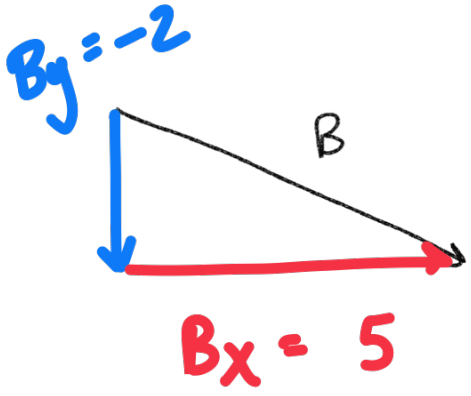
-B

flip B





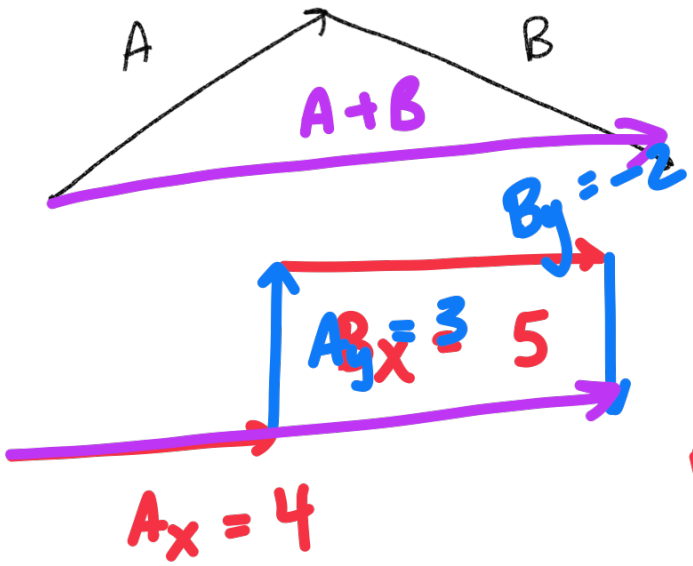




A + B

$A+B$

$(A_x+B_x)+(A_y+B_y)$



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

$\theta = \tan^{-1}\frac{y}{x}$

$A_x = 4 \quad B_x = 5$

$A_x + B_x = 9$

$A_y = 3 \quad B_y = -2$

$A_y + B_y = 1$

$r = \sqrt{9^2+1^2} = \sqrt{81+1}$

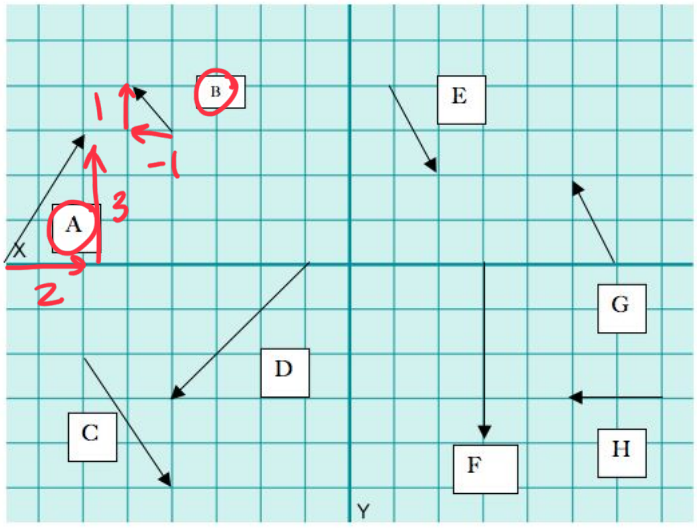
$\sqrt{82}$

$\theta = \tan^{-1}\left(\frac{1}{9}\right) = 6.3°$

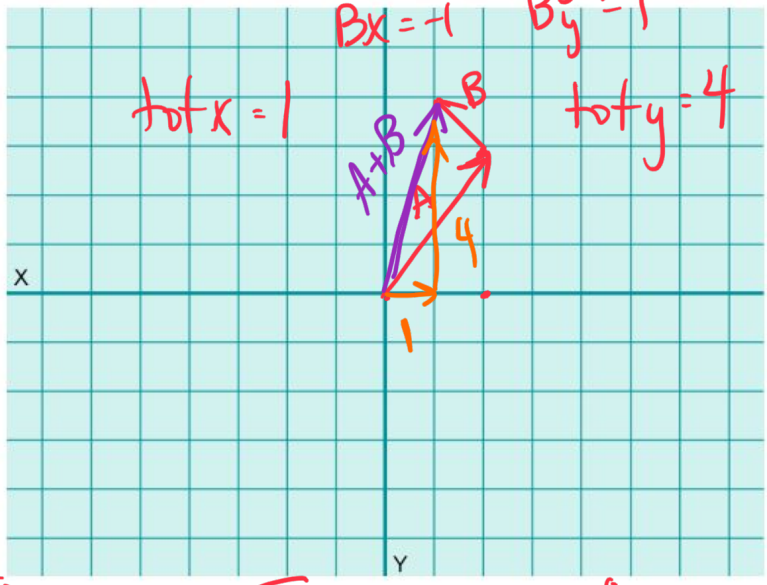
$(\sqrt{82}, 6.3°)$

7.) Which of the following are vector quantities and which are scalar quantities?(a) your age (b) acceleration (c) velocity (d) speed (e) mass

8.) Given the following vectors, create head to tail models and find the resultant magnitude and direction. the arrows are not perfect but use the corner that they are closest to



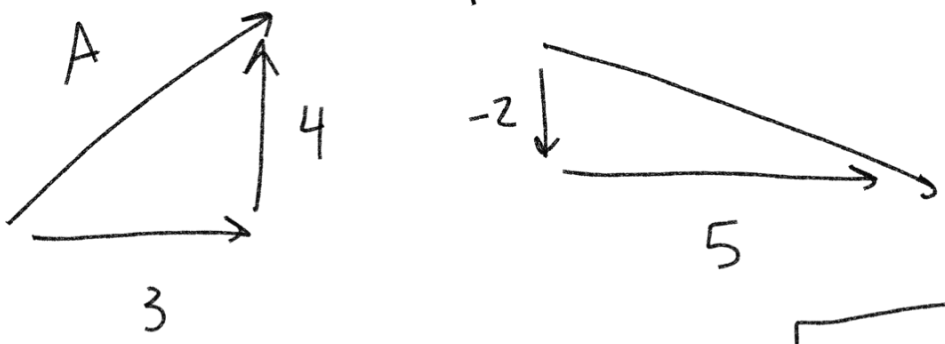
a) A + B



Magnitude = $\sqrt{17}$ Direction = 76°

$r = \sqrt{x^2+y^2} = \sqrt{(1)^2+(4)^2} = \sqrt{1+16} = \sqrt{17}$

$\theta = \tan^{-1}\frac{y}{x}$ $\tan^{-1}\left(\frac{4}{1}\right) = 76$



total x component

$3+5=8$

total y component

$4+(-2)=2$

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

$\sqrt{8^2+2^2}=\sqrt{64+4}$

$\sqrt{68}=2\sqrt{17}$

$\theta=\tan^{-1}\left(\frac{2}{8}\right)=14^\circ$

$\boxed{(2\sqrt{17},\ 14^\circ)}$

x y

$A: \langle 5\hat{i}-4\hat{j}\rangle$

x y

$B: \langle -6\hat{i}+\hat{j}\rangle$

Find $A+B$

$\langle A_x+B_x,\ A_y+B_y\rangle$

$\langle 5+(-6),\ -4+1\rangle$

$\langle -1,\ -3\rangle = \langle -\hat{i}-3\hat{j}\rangle$

x y

$r=\sqrt{x^2+y^2}=\sqrt{(-1)^2+(-3)^2}$

$\sqrt{1+9}$

$\sqrt{10}$

$\theta: \tan^{-1}\frac{y}{x}=\tan^{-1}\left(\frac{-3}{-1}\right)$

$180+71.6^\circ=251.6$