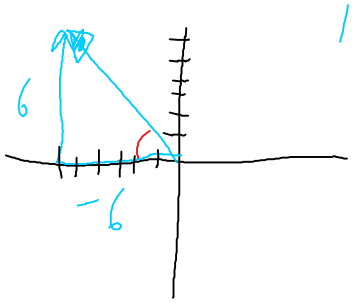
ex8 Find $[\|\vec{v}\|, \theta]$ form

~~Find the direction angle of each vector.~~

a. $\vec{v} = -6\mathbf{i} + 6\mathbf{j}$ **b.** $\mathbf{v} = -7\mathbf{i} - 4\mathbf{j}$

$\vec{V} = \langle -6, 6 \rangle$

$\vec{V} = [\|\vec{V}\|, \theta^\circ] = [8.485, 135^\circ]$



$\|\vec{v}\| = \sqrt{(-6)^2 + (6)^2} = \sqrt{72} = 8.485$

$\tan\theta = \frac{6}{+6}$ $\tan^{-1}\left(\frac{6}{6}\right) = 45^\circ$

$180 - 45 = 135$

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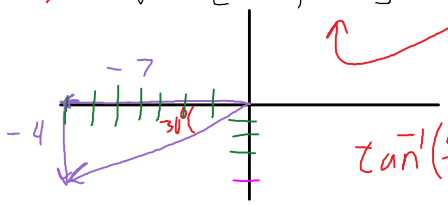
b) $\vec{v} = -7i - 4j$

$\vec{V} = \langle -7, -4 \rangle$

$\vec{V} = [8.062, 210^\circ]$



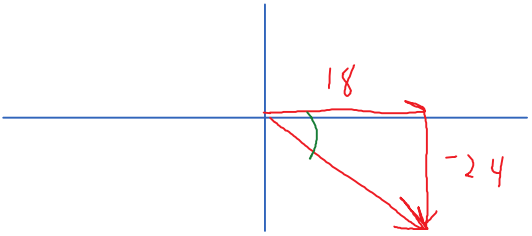
$\|\vec{V}\| = \sqrt{(-7)^2 + (-4)^2} = 8.062$

$\tan^{-1}\left(\frac{4}{7}\right) = 30^\circ + 180$

#3 $\vec{v} = 18i - 24j$

$\vec{V} = \langle 18, -24 \rangle$

$\vec{V} = [30, 307^\circ]$



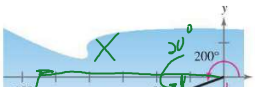
$\|\vec{V}\| = \sqrt{18^2 + (-24)^2} = 30$

$\tan^{-1}\left(\frac{24}{18}\right) = 53^\circ$

$360 - 53$

Ex 9

Find the component form of the vector that represents the velocity of an airplane descending at a speed of ~~100~~ 150 miles per hour at an angle θ 30° below the horizontal ($\theta = 195^\circ$).



$\cos 300 = \frac{x}{150}$

$(150)\cos 300 = x$

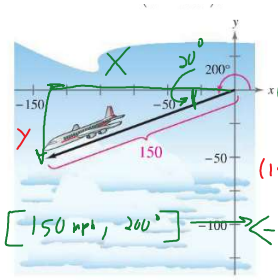


Figure 6.22

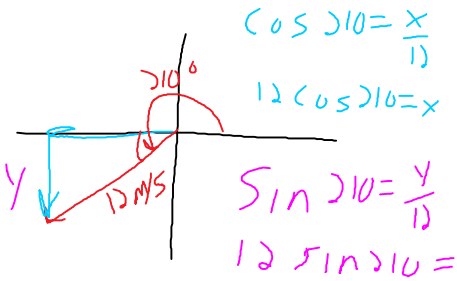
Ex 11

Kyle paddles a canoe 6 m/s due east (toward shore).
The wind blows 12 m/s @ 210°.

What is his component velocity vector? $\vec{C} = \langle 6, 0 \rangle$

What is the winds component velocity vector?

$\vec{W} = \langle 10, -6 \rangle$



$\cos 210 = \frac{x}{12}$

$12 \cos 210 = x$

$\sin 210 = \frac{y}{12}$

$12 \sin 210 = -6$

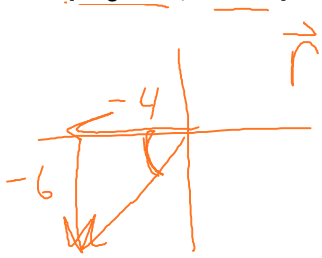
What is the resultant component velocity?

$\vec{C} = \langle 6, 0 \rangle$

$\vec{W} = \langle -10, -6 \rangle$

$\vec{r} = \langle -4, -6 \rangle$

What is the resultant velocity in [Magnitude, direction] form?



$\vec{r} = [7.211 \text{ m/s}, 236°]$

$\tan^{-1}\left(\frac{6}{4}\right) = 56°$

$56 + 180$

$\|\vec{r}\| = \sqrt{(-6)^2 + (-4)^2}$

6.3 II pg 426: 61-71 odd, 77-82, 87

81)

82