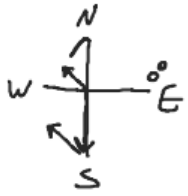



C) A ship is heading due south at 15 mph. The current is flowing northwest at 3 mph. Find the actual bearing and speed of the ship.

Ship = $\langle 15\cos 270, 15\sin 270\rangle$

Wind = $\langle 3\cos 135°, 3\sin 135\rangle$

$\vec{S}+\vec{W} = \langle 15\cos 270° + 3\cos 135,\ 15\sin 270° + 3\sin 135\rangle$

$\langle -2.12, -12.89\rangle$

Speed = $\sqrt{(-2.12)^2+(-12.89)^2}$

Speed = 13.06 mph

$\tan^{-1}\left(\frac{y}{x}\right)$

$\tan^{-1}\left(\frac{-12.89}{-2.12}\right) = 80.4$

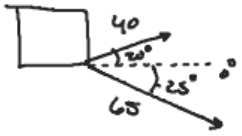
260.66

**Shooting a basketball**: A basketball is shot at an angle 65° with an initial speed of 12m/sec.

a. Find the component form of the initial velocity.

$\langle 12\cos 65°,\ 12\sin 65°\rangle$

~~b.~~ Give an interpretation of the horizontal and vertical components of the velocity.




**Combining Forces**: A force of 40 lbs acts on an object at angle of 20°. A second force of 65 pounds acts on the object at an angle if −25°. Find the direction and magnitude of the resultant force.

$\vec{F}_1 = \langle 40\cos 20°, 40\sin 20°\rangle$

$\vec{F}_2 = \langle 65\cos(-25)°, 65\sin(-25°)\rangle$ (335)

$\vec{F}_1+\vec{F}_2 = \langle 40\cos 20 + 65\cos(-25),$

$40\sin 20 + 65\sin(-25)\rangle$

$\langle 96.49, -13.79\rangle$

$\sqrt{96.49^2+(-13.79)^2}$

97.47 lbs

$\tan^{-1}\left(\frac{-13.79}{96.49}\right) = -8.13°$

351.87°