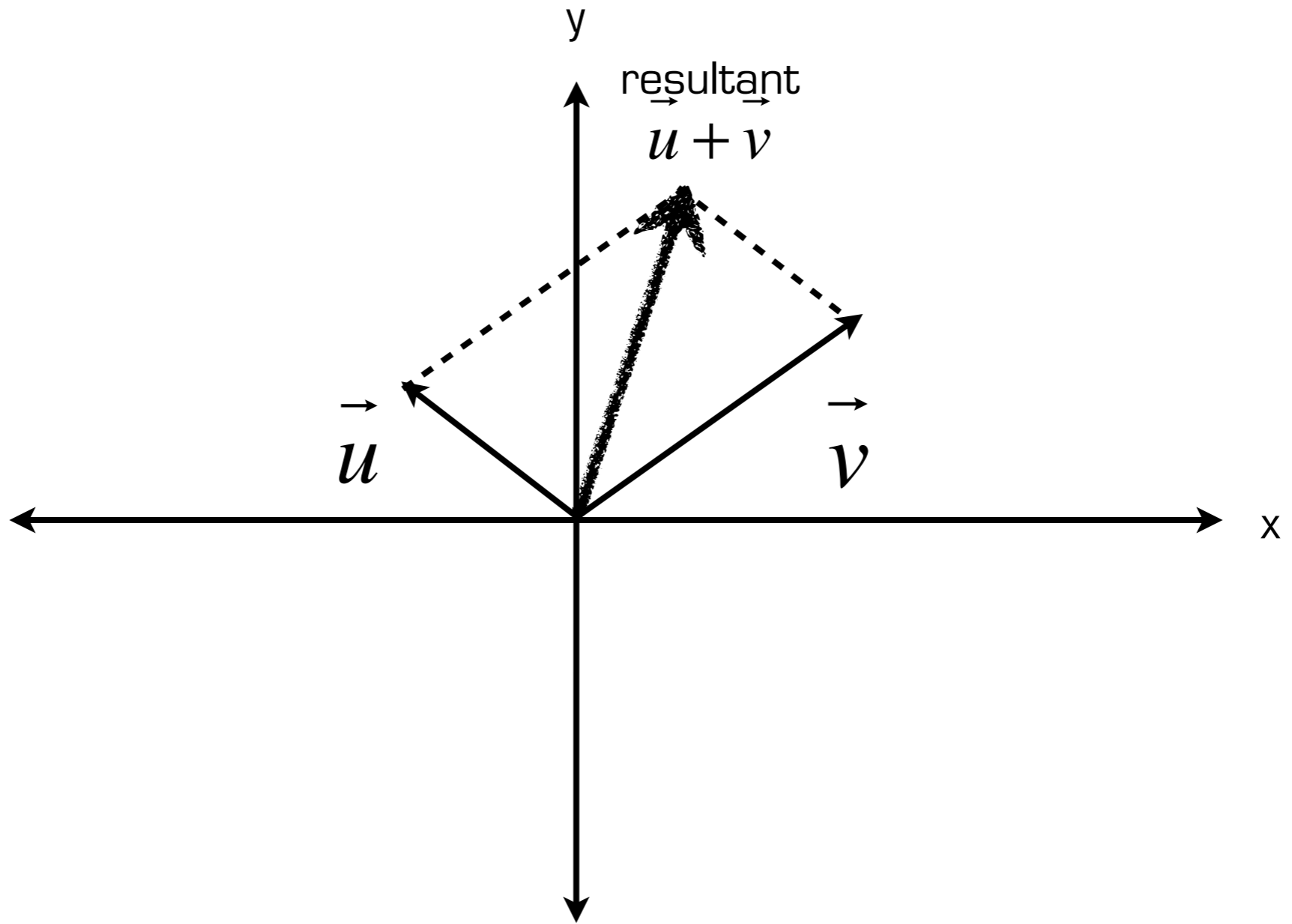


Vector Applications

Vector Addition
Parallelogram Law

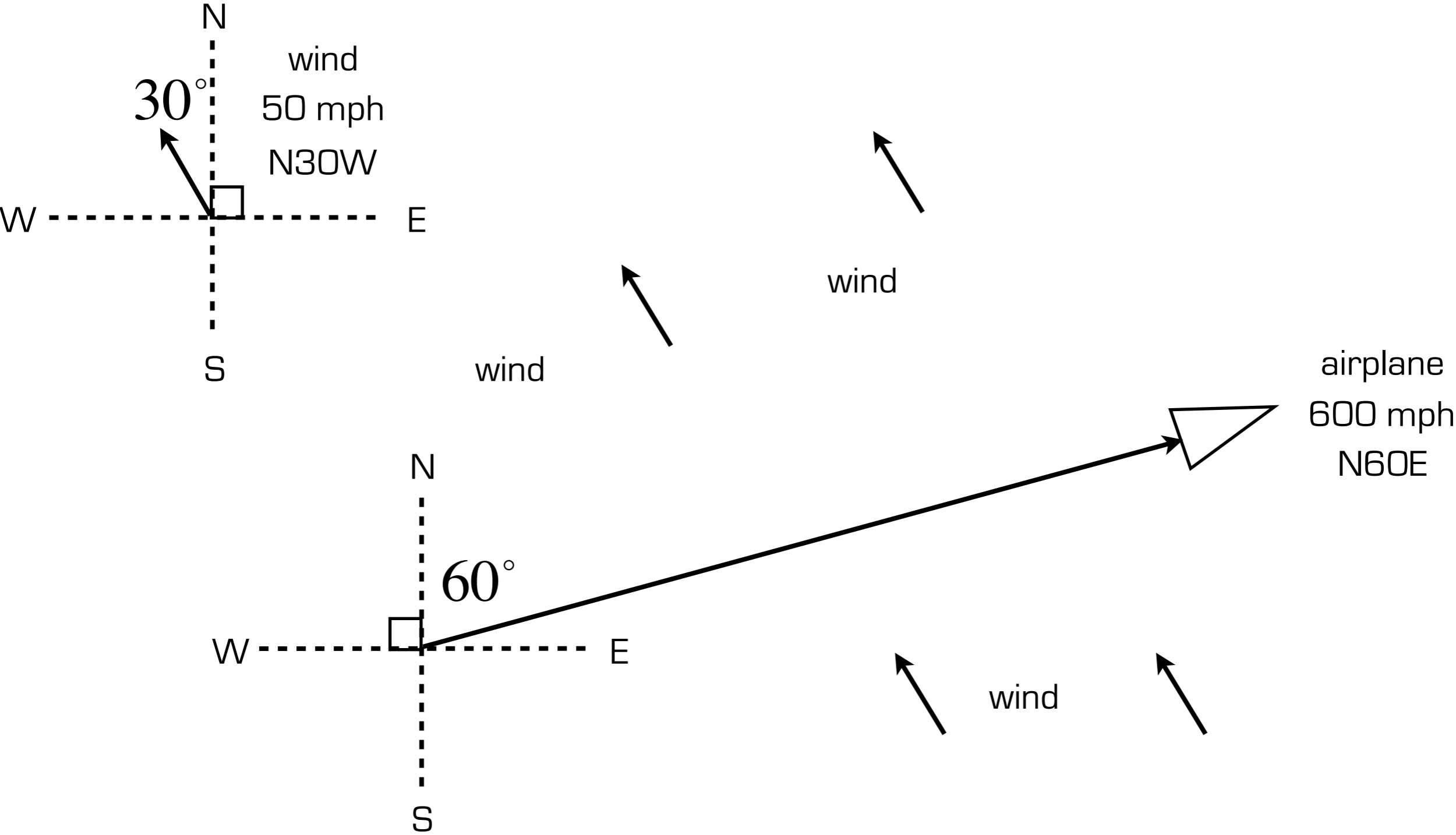
$$\vec{u} + \vec{v}$$

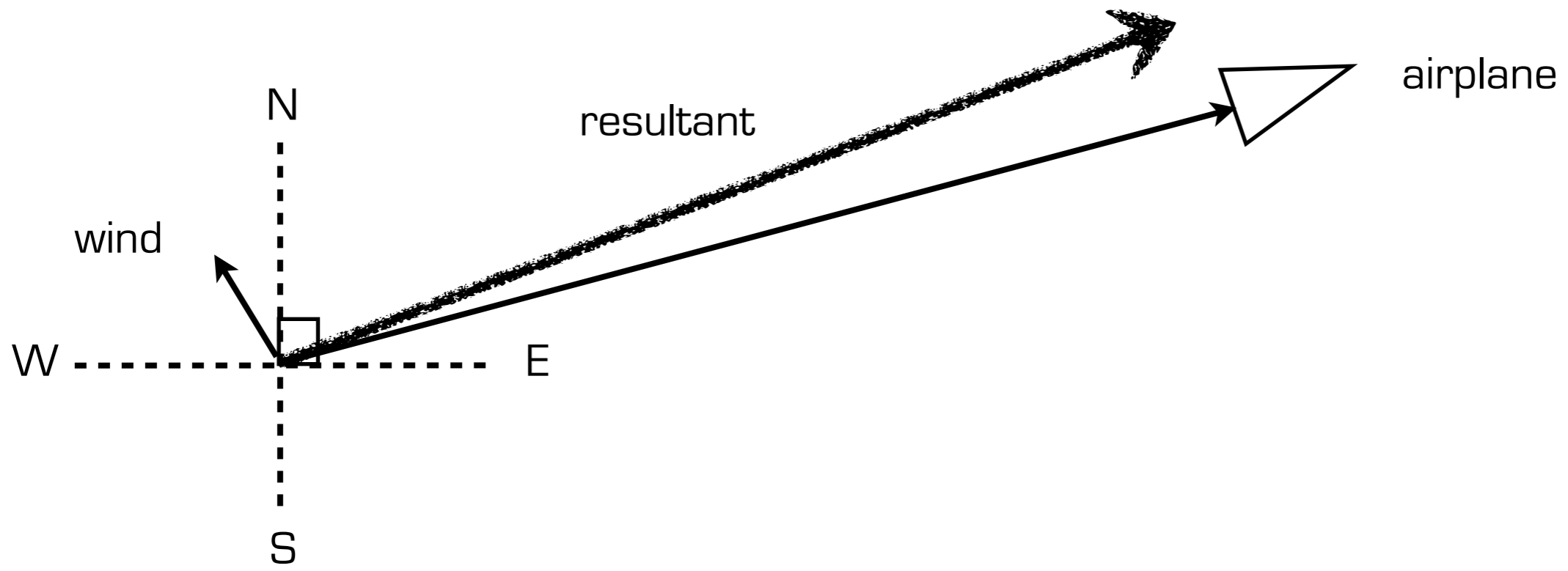


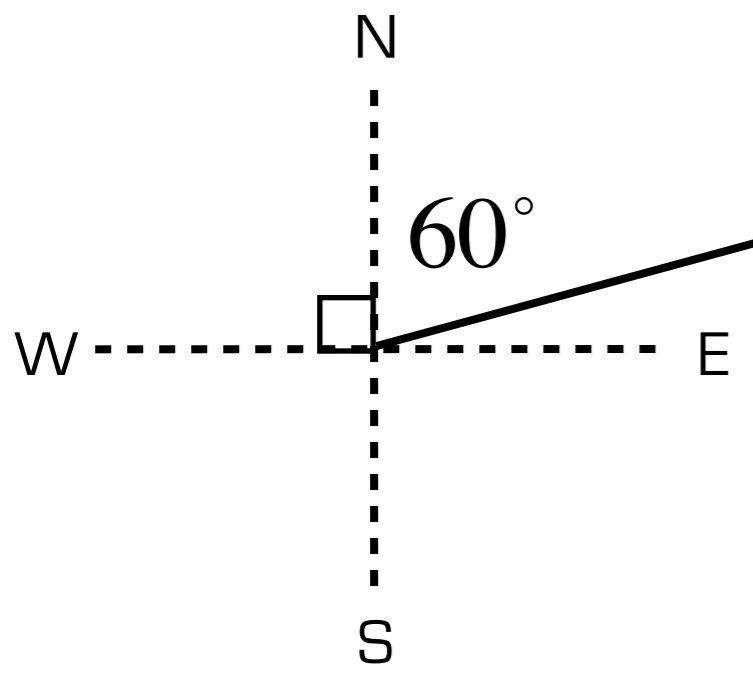
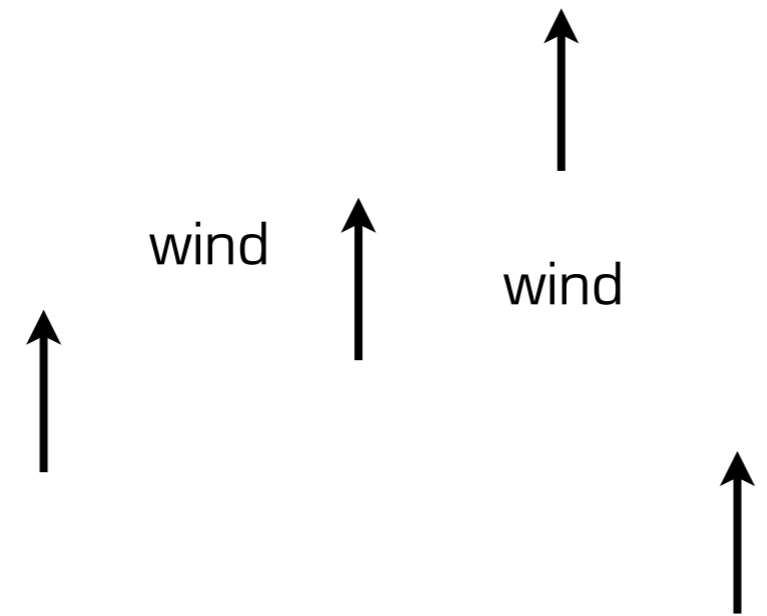
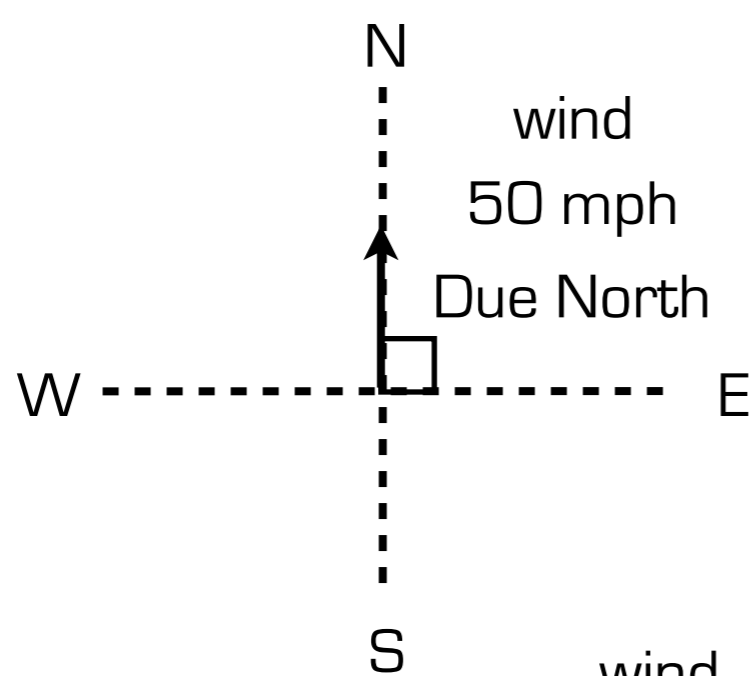
Airplane and Wind

An airplane heads N60E at a speed of 600 mph relative to the air. A wind begins to blow in the direction N30W at 50 mph.

- (a) Find the velocity of the airplane as a vector.
- (b) Find the velocity of the wind as a vector.
- (c) Find the true speed and direction of the airplane.

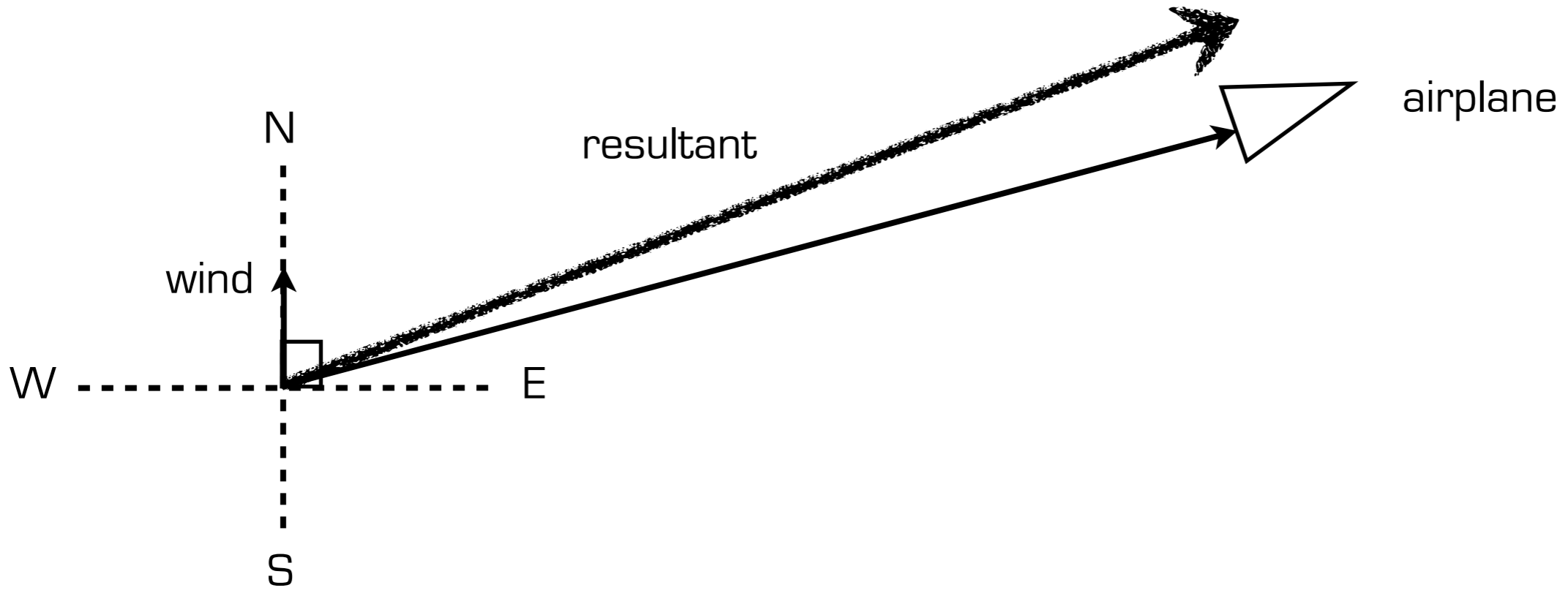






airplane
600 mph
N60E

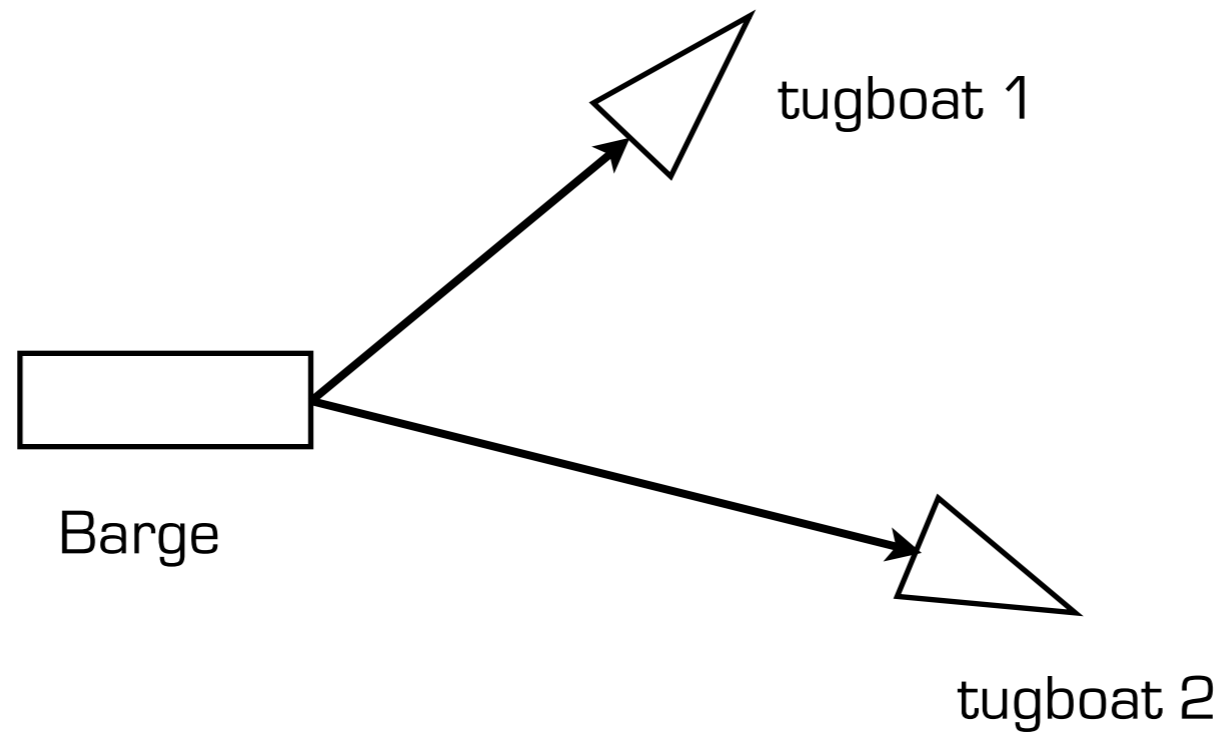


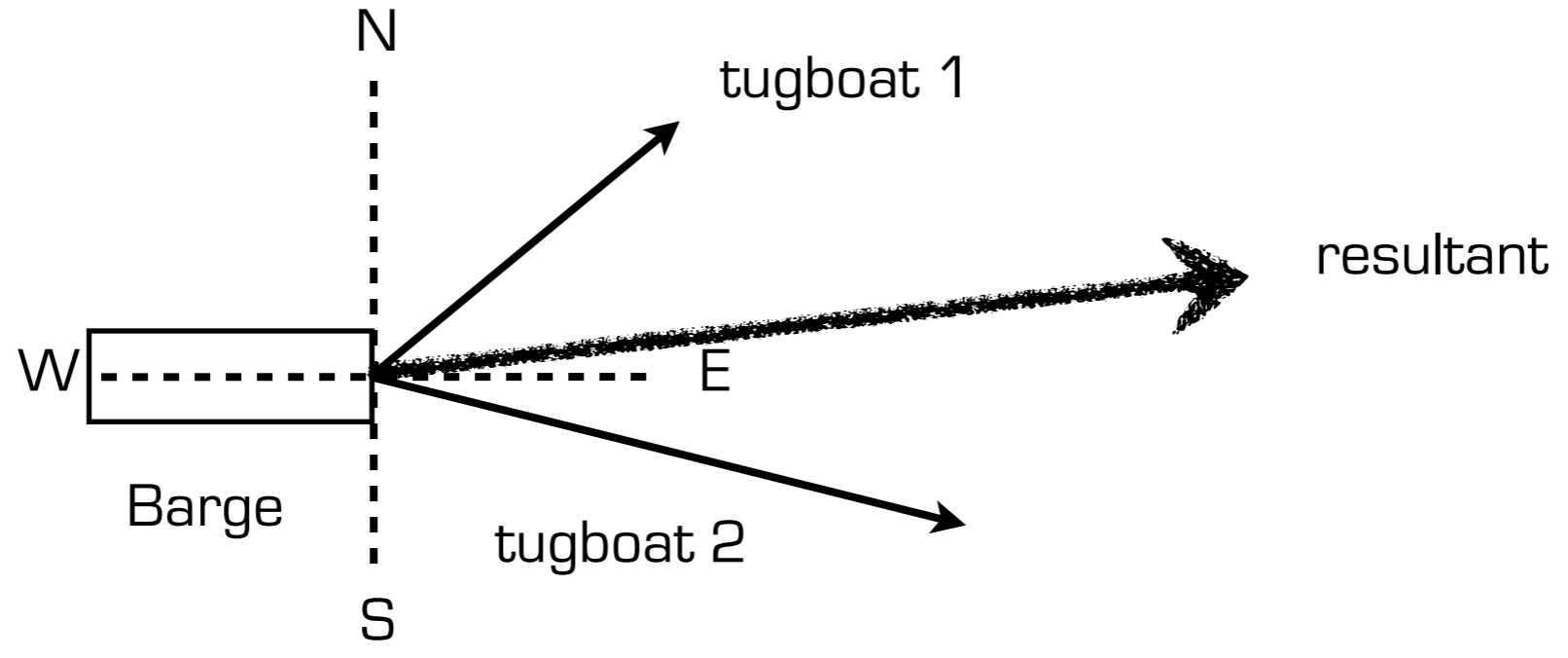


Tugboats and a Barge

Two tugboats are pulling a barge, as shown. One pulls with a force of 20,000 pounds in the direction N50E and the other with a force of 34,000 pounds in the direction S75E.

- (a) Find the resultant force on the barge as a vector.
- (b) Find the magnitude and the direction of the resultant force.

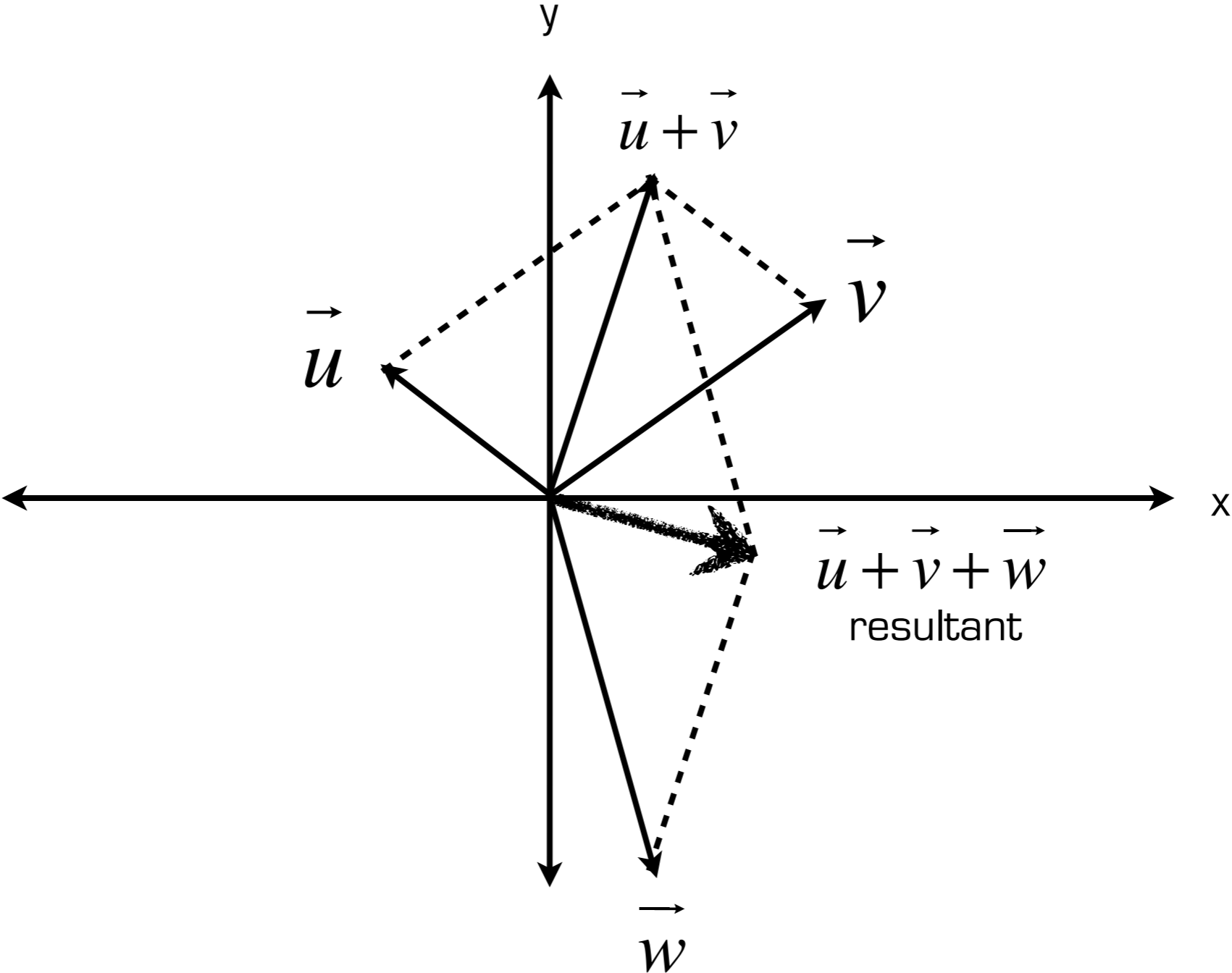




Vector Addition

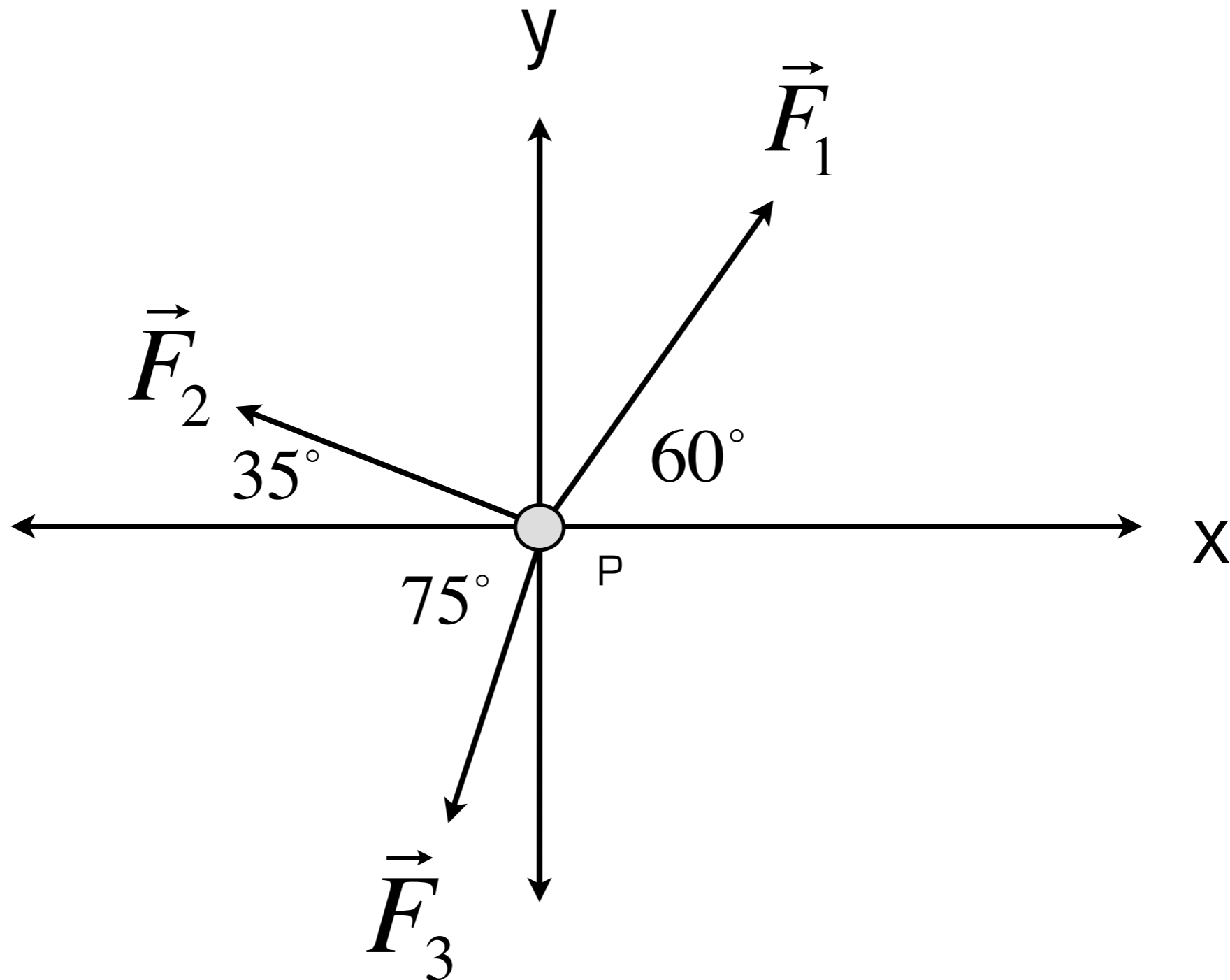
Parallelogram Law

$$\vec{u} + \vec{v} + \vec{w}$$



Forces on an object P

- (a) Find the resultant force acting on P, if the magnitude of force 1, force 2, and force 3, are 12 pounds, 10 pounds, and 8 pounds respectively.
- (b) What is the resultant force and its magnitude and direction?



Equilibrium of Tensions

A 100 pound weight hangs from a string as shown. Find the tensions (vectors) on each string.

