

Vector Worksheet

Use the following vectors in all the following problems.

$$\mathbf{A} = 35 \text{ km at } 25^\circ \text{ N of E} \quad \mathbf{B} = 15 \text{ km at } 10^\circ \text{ E of N}$$

$$\mathbf{C} = 20 \text{ km at } 43^\circ \text{ S of E} \quad \mathbf{D} = 40 \text{ km at } 28^\circ \text{ S of W}$$

1. Break all the vectors above into their North/South and East/West coordinates.

2. Sketch and Find the resultant Vectors (Magnitude and Direction)

a. $A + B$

b. $D - A$

c. $C + C$

d. $A + B - D$

3. An airplane is flying 340 km/hr at 12° East of North. The wind is blowing 40 km/hr at 34° South of East. What is the plane's actual **velocity**?

4. . You push on a box with a **force** of 500 Newtons directly north. Another person pushes the box with a **force** directly east. The **resultant** force has a magnitude of 635N. What direction is the box accelerating in if these are the only forces acting on it?

5. A boat is heading across a river at a **velocity** of 25 mph. The river is flowing downstream at 10 mph.
- a. What is the actual **velocity** of the boat?

- b. What direction would the boat have to head in order to land on the other side directly opposite its starting position?