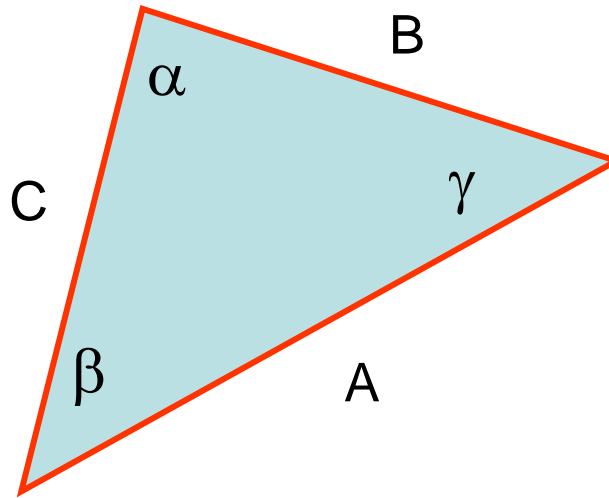


Addition and Subtraction

- Using simple trig
- Usually avoided in other physics courses
- Good only for two 2D vectors and their resultant or for resolving a 2D vector into components.
- Slow and unwieldy for 3 or more 2D vectors.
- Very difficult with 3D vectors.

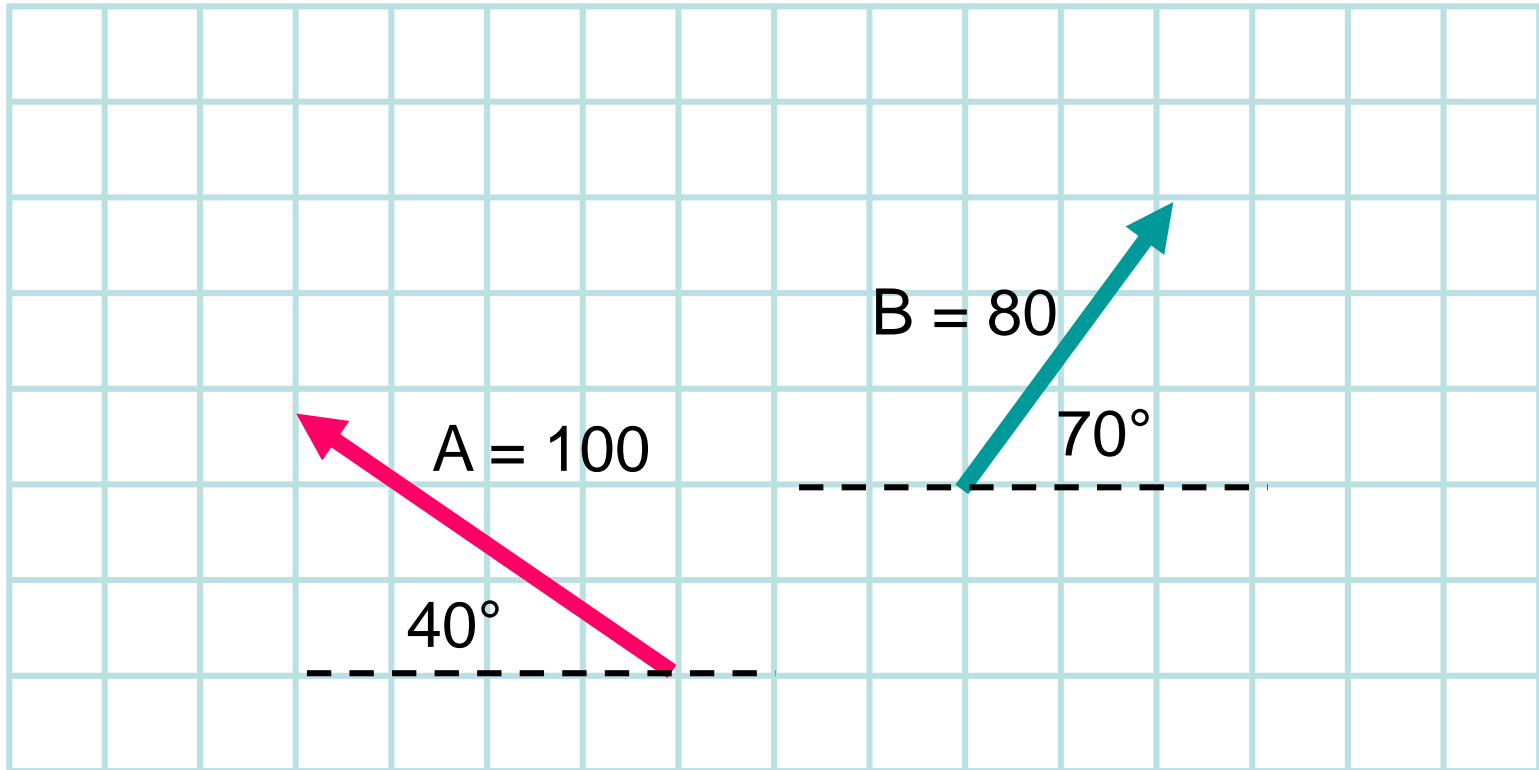
Basic Rules

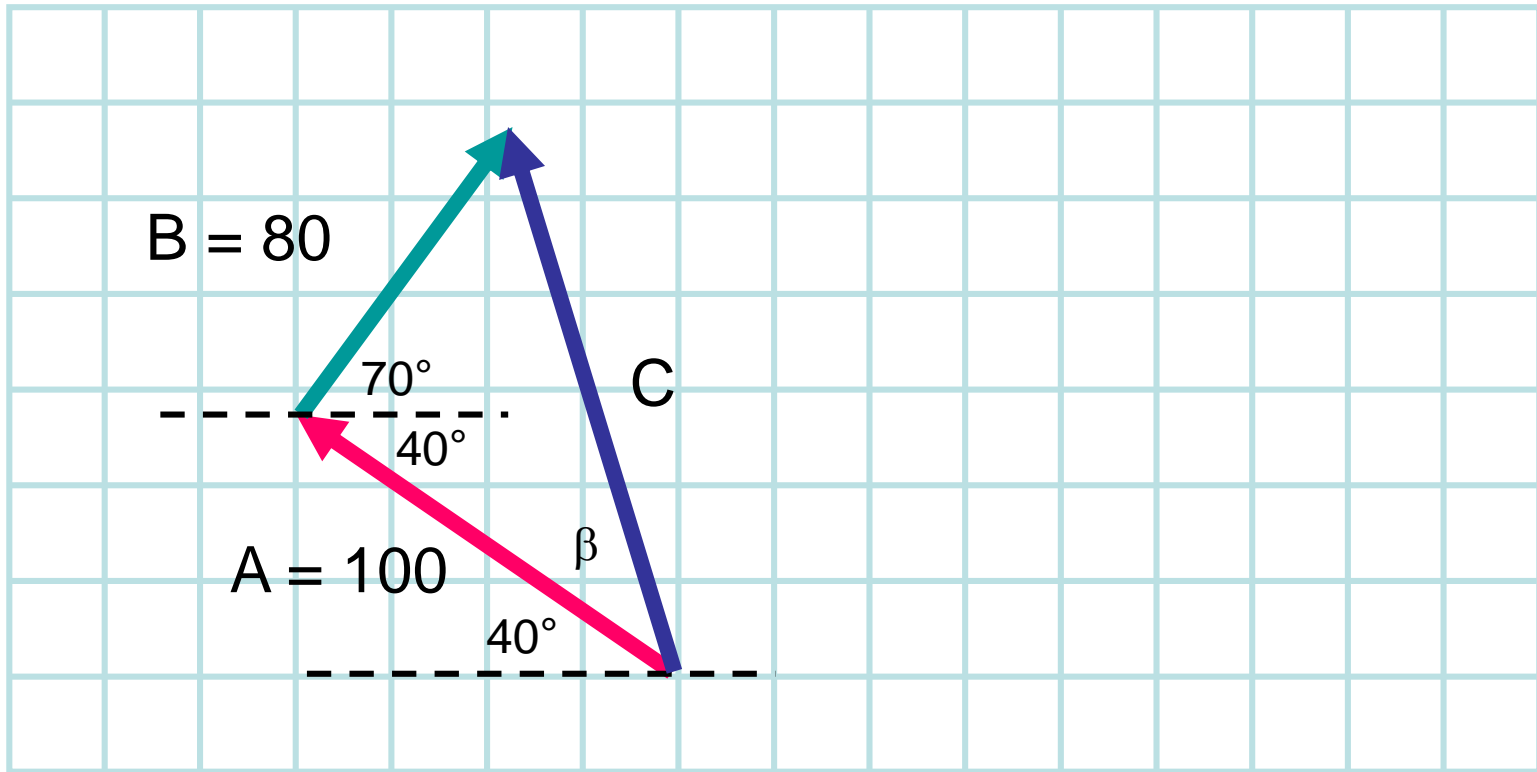


SineLaw: $\frac{\sin \alpha}{A} = \frac{\sin \beta}{B} = \frac{\sin \gamma}{C}$

CosineLaw: $C^2 = A^2 + B^2 - 2AB \cos \gamma$

Find $\vec{C} = \vec{A} + \vec{B}$ and $\vec{D} = \vec{A} - \vec{B}$

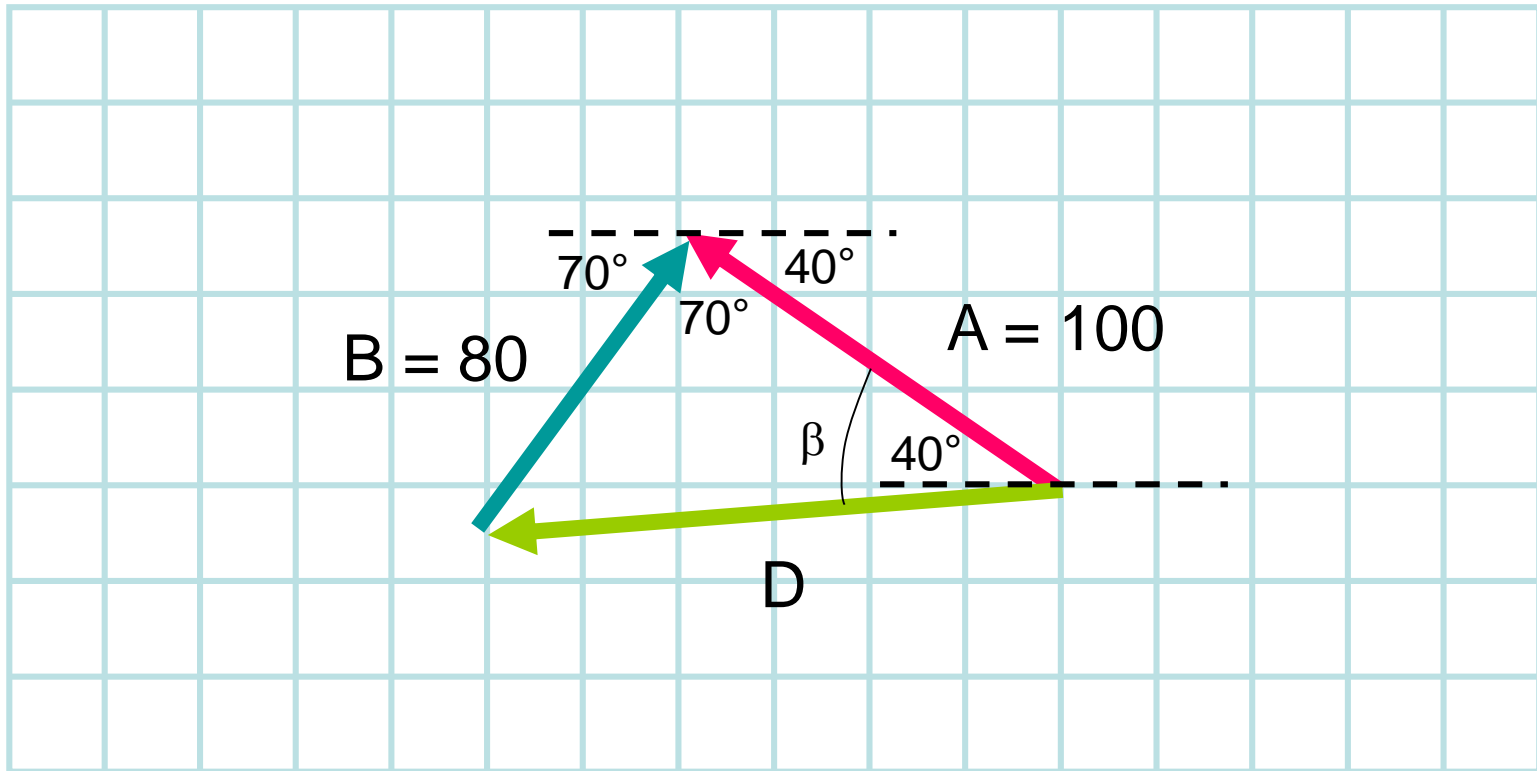




$$C = \sqrt{100^2 + 80^2 - 2(100)(80)\cos(110^\circ)} = 147.89$$

$$\frac{\sin \beta}{80} = \frac{\sin(110^\circ)}{147.89} \quad \beta = \arcsin(0.5083) = 30.55^\circ$$

$$\vec{C} = 148 \text{ at } 70.6^\circ \text{ to } -x \text{ axis}$$



$$D = \sqrt{100^2 + 80^2 - 2(100)(80)\cos(70^\circ)} = 104.54$$

$$\frac{\sin \beta}{80} = \frac{\sin(70^\circ)}{104.54} \quad \beta = \arcsin(0.7191) = 45.98^\circ$$

$$\vec{D} = 105 \text{ at } 6.0^\circ \text{ below } -x \text{ axis}$$