

Example #1 p. 3 Ch. 9

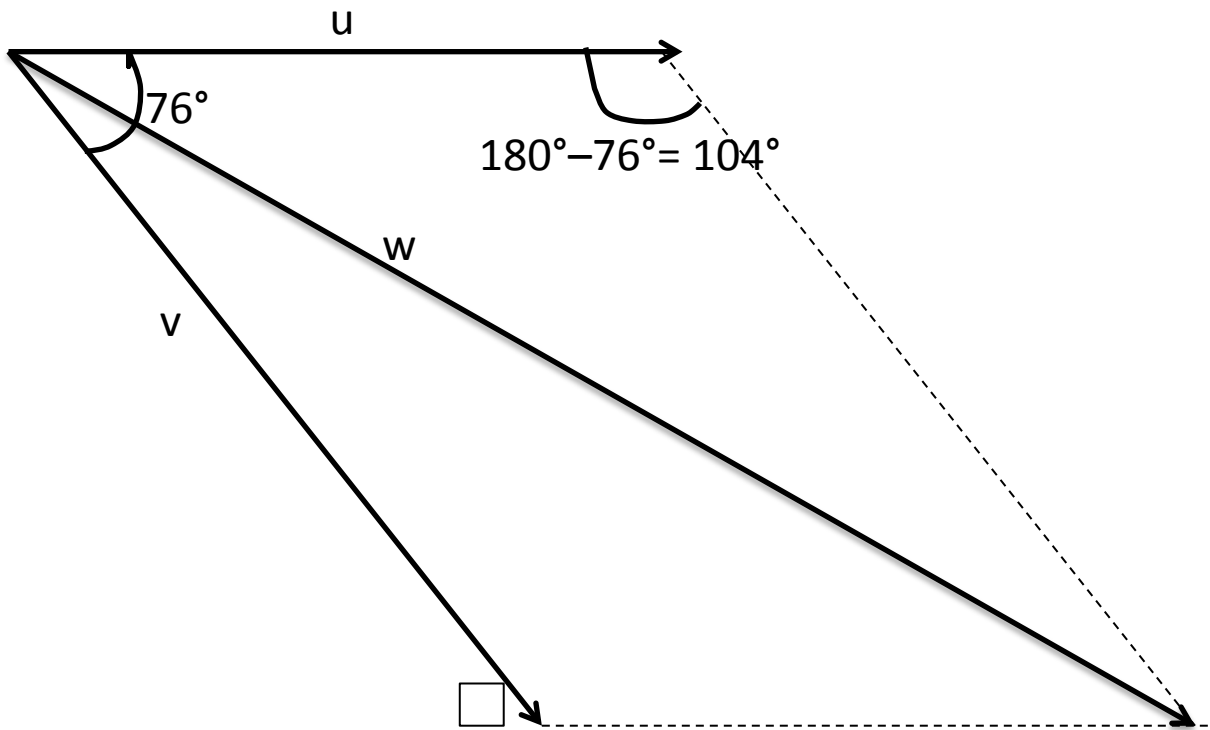
The vectors \mathbf{u} & \mathbf{v} are initial point to initial point.

If $|\mathbf{u}| = 32$ & $|\mathbf{v}| = 48$

and the angle between them is 76° , find the
magnitude of the resultant

vector, \mathbf{w} .

A picture would be nice



Using Law of Cosines $|w|$ can be found

- Notice that the lower horizontal dotted line is also u , because we have created a parallelogram.
- Angle opposite 104° is also 104°
- Using the lower triangle & Law of Cosines

$$w^2 = 32^2 + 48^2 - 2(32)(48)\cos 104^\circ$$

Thus, $w \approx \sqrt{4071.184063} \approx 63.80583095$

≈ 64 units

Thus, w is

$$w \approx 64 \text{ units}$$

Note: This is not the only way to solve this problem but it is a nice use of the Law of Cosines.