

Tutorial 10

Week of November 19, 2018

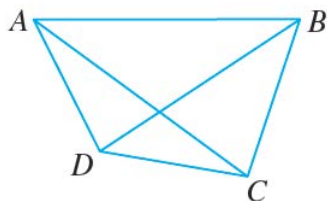
If there is some value a such that $f''(a) = 0$ then:

- If $x = a$ is also a critical number of f , then the second derivative test is inconclusive and there could be a minimum, maximum, or inflection point. Further investigation is required.
- If $x = a$ is not a critical number of f then we can conclude that f has an inflection point at $x = a$.

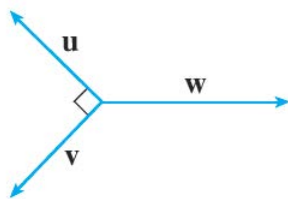
This is just a shortcut to finding inflection points without finding intervals of concavity. But if you are required to find intervals of concavity, just use those to find your inflection points. This is super minor stuff - don't worry about it.

1. Write the following combinations of vectors as a single vector.

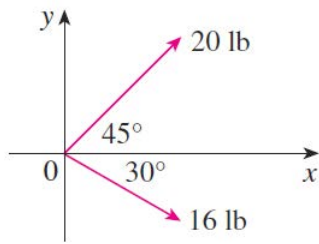
- (a) $\overrightarrow{AB} + \overrightarrow{BC}$
- (b) $\overrightarrow{CD} + \overrightarrow{DB}$
- (c) $\overrightarrow{DB} - \overrightarrow{AB}$
- (d) $\overrightarrow{DC} + \overrightarrow{CA} + \overrightarrow{AB}$



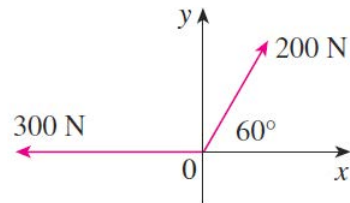
2. If $|\mathbf{u}| = |\mathbf{v}| = 1$ and $\mathbf{u} + \mathbf{v} + \mathbf{w} = \mathbf{0}$, find $|\mathbf{w}|$.



3. Find the magnitude of the resultant force and the angle it makes with the positive x-axis.



(a)



(b)

4. An airplane has an air speed of 300 km/hr and is heading due west. If it encounters a wind blowing south at 50 km/hr, what is the resultant ground velocity of the plane? What is the angle of the resultant ground velocity from the positive x-axis?