

Parallelogram law of addition of vectors

Questions

1. For what angle between the vectors is the resultant of the maximum magnitude?
2. For what angle between the vectors is the resultant of the minimum magnitude?
3. Under what condition(s) does the resultant vector make equal angles w.r.t to the initial vectors i.e. $\mathbf{A}$ and $\mathbf{B}$?
4. Can two vectors of equal magnitude add up to zero?
5. Can two vectors of unequal magnitude add up to zero?
6. Can addition of two vectors of same magnitude give a resultant also of the same magnitude?
7. Why is always the smaller angle between the vectors used in calculating the result using parallelogram law of addition of vectors?
8. Why is the resultant angle, in the derivation, calculated w.r.t. $\mathbf{A}$?
9. For a fixed value of angle between the vectors (θ), how does the angle made by the resultant (α) change with increase in magnitude of $\mathbf{A}$?
10. Under what condition(s) does the angle made by the resultant (α) bisect the angle between the vectors (θ)?

Note :

While simulations help to provide valuable insights and visualizations, a rigorous mathematical solution should always be considered as a benchmark, demonstrating not just familiarity with the concept, but a deep understanding of the underlying principles.

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