

Vectors.

The diagram illustrates a vector A in two ways. On the left, a red arrow is shown with its starting point labeled 'TAIL' and its ending point labeled 'HEAD'. A bracket between the tail and head is labeled 'MAGNITUDE'. On the right, the same vector A is shown in a coordinate system with a vertical y -axis and a horizontal x -axis. The tail of the vector is at the origin (0,0).

- Vectors can be moved parallel to themselves.
- Coordinate system is **ALWAYS** attached to the tail of each vector.

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The diagram shows a vector B in a coordinate system where the vertical axis is labeled y and N (North) and the horizontal axis is labeled x and E (East). The vertical axis also has S (South) and the horizontal axis has W (West). The vector B is in the first quadrant. Two angles are shown: a green angle θ_B measured counter-clockwise from the N axis, and a blue angle θ_B measured clockwise from the E axis.

DIRECTION OF VECTOR B IS:

θ_B° N of E

STARTING AXIS

THE DIR. IN WHICH YOU GO θ°

θ_B° E of N

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①

②

③ 20° N of W

④ 30° W of N

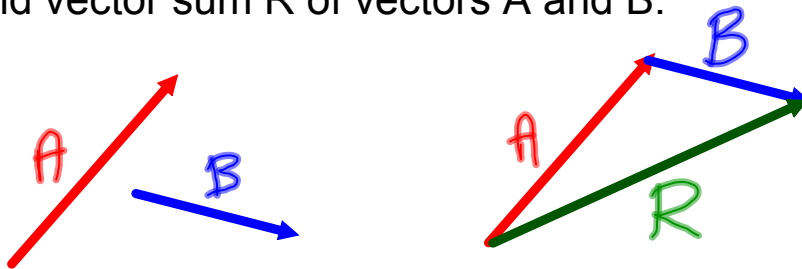
15° S of W

65° W of S

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**Graphical vector addition.
Head-to-tail method.**

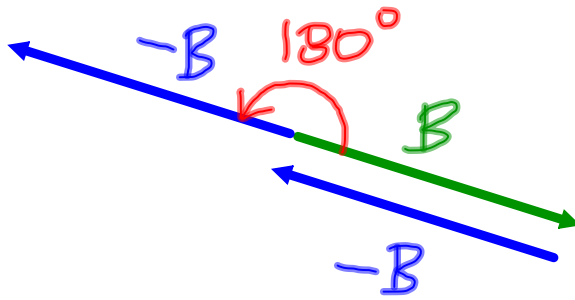
Find vector sum R of vectors A and B.



The resultant vector R starts at the **tail of the first** vector and it points to the **head of the last** vector.

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Reverse vector (-B) - same length as the original vector B but the direction is 180° opposite.



How to subtract vectors - we add a reverse vector.

$$R = A - B$$

$$R = A + (-B)$$

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