

Two Angled Vectors

For each problem:

- Draw both vectors accurately head-to-tail.
- Calculate the magnitude of the resultant displacement.
- Calculate the direction of the resultant displacement.

Part A — Same-Quadrant Vectors

- Travel 8.0 m, 30° north of east, and then 6.0 m, 45° north of east. Determine the resultant displacement.
- Travel 9.0 m, 30° east of north, and then 6.0 m, 35° north of east. Determine the resultant displacement.

Part B — Adjacent Quadrants

- Travel 12.0 m, 30° north of east, and then 5.0 m, 20° south of east. Determine the resultant displacement.
- Travel 10.0 m, 30° north of east, and then 10.0 m, 30° south of east. Determine the resultant displacement.
- Travel 8.0 m, 20° north of east, and then 12.0 m, 30° south of east. Determine the resultant displacement.

Part C — Adjacent Quadrants with Direction Switching

- Travel 12.0 m, 30° north of east, and then 5.0 m, 20° east of south. Determine the resultant displacement.
- Travel 10.0 m, 30° east of north, and then 10.0 m, 60° north of west. Determine the resultant displacement.

Part D — Opposite-Quadrant Vectors

- Travel 14.0 m, 30° north of east, and then 5.0 m, 20° south of west. Determine the resultant displacement.
- Travel 12.0 m, 20° north of east, and then 8.0 m, 40° south of west. Determine the resultant displacement.

Part E — Nearly Opposing Vectors

10. Travel 10.0 m, 35° north of east, and then 10.0 m, 40° west of south. Determine the resultant displacement.
11. Travel 12.0 m, 25° north of east, and then 11.0 m, 55° west of south. Determine the resultant displacement.

Part F — Displacement Between Two Angled Positions

12. An object's initial position is 10.0 m, 30° north of east. Its final position is 10.0 m, 30° north of west. Determine its displacement.
13. An object's initial position is 12.0 m, 25° north of east. Its final position is 18.0 m, 40° north of east. Determine its displacement.
14. An object's initial position is 15.0 m, 20° east of north. Its final position is 22.0 m, 35° north of west. Determine its displacement.