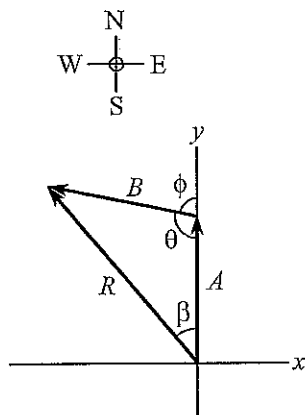


020 (part 1 of 2) 10.0 points

A car travels 12.8 km due north and then 39.4 km in a direction $\phi = 46.7^\circ$ west of north.



Find the magnitude of the car's resultant displacement.

Answer in units of km

021 (part 2 of 2) 10.0 points

Calculate the direction of the car's resultant displacement, measured counterclockwise from the northerly direction.

Answer in units of $^\circ$

022 (part 1 of 2) 10.0 points

A particle undergoes two displacements. The first has a magnitude of 172 cm and makes an angle of 121° with the positive x axis. The resultant displacement has a magnitude of 153 cm and is directed at an angle of 42.9° to the positive x axis.

Find the magnitude of the second displacement.

Answer in units of cm

023 (part 2 of 2) 10.0 points

What is the direction of the second displacement (with positive measured counterclockwise from the x axis, and between the limits of -180° and $+180^\circ$)?

Answer in units of $^\circ$

024 10.0 points

A person walks 48 m East and then walks 31 m at an angle 40° North of East.

What is the magnitude of the total displacement?

Answer in units of m

025 (part 1 of 2) 10.0 points

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An airplane flies 245 km due west from city A to city B and then 377 km in the direction of 47.6° north of west from city B to city C.

What is the distance between city A and city C?

Answer in units of km

026 (part 2 of 2) 10.0 points

Relative to city A, in what direction is city C? Answer with respect to due east, with the counter-clockwise direction positive, within the limits of -180° to $+180^\circ$.

Answer in units of $^\circ$

027 (part 1 of 2) 10.0 points

Consider three force vectors $\vec{F}_1$ with magnitude 32 N and direction 20° , $\vec{F}_2$ with magnitude 31 N and direction -140° , and $\vec{F}_3$ with magnitude 21 N and direction 33° . All direction angles θ are measured from the positive x axis: counter-clockwise for $\theta > 0$ and clockwise for $\theta < 0$.

What is the magnitude F of the net force vector $\vec{F} = \vec{F}_1 + \vec{F}_2 + \vec{F}_3$?

Answer in units of N

028 (part 2 of 2) 10.0 points

What is the direction of $\vec{F}$ as an angle between the limits of -180° and $+180^\circ$ from the positive x axis with counterclockwise as the positive angular direction.

Answer in units of $^\circ$