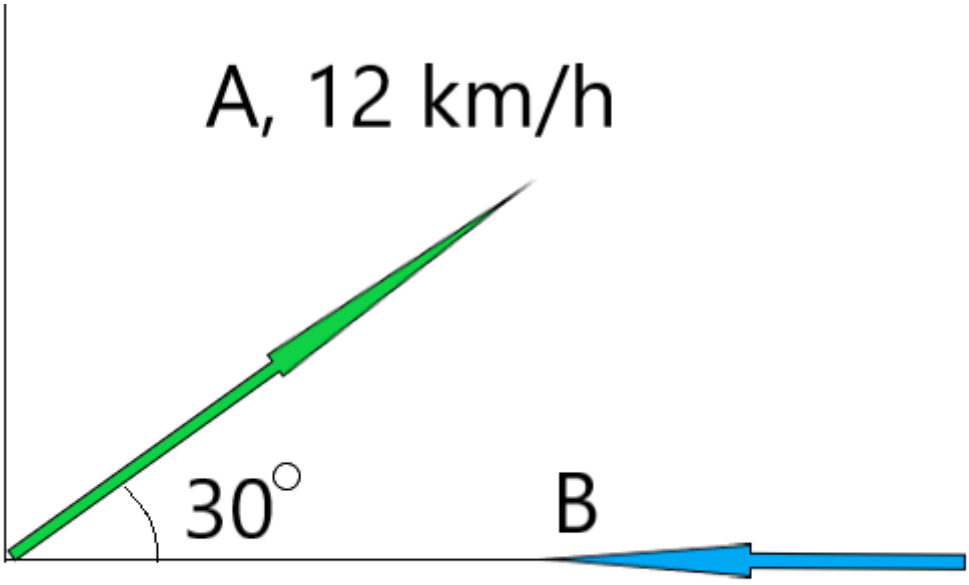
Answer on Question #81814 - Physics - Mechanics – Relativity

A ship A, steaming in a direction 30° with a steady speed of 12km/h, sight a ship B. The velocity of B relative to A is 10km/h in a direction of the velocity of B. Find the magnitude and direction

Solution



Let us find the magnitude of the velocity B relative to the sea, knowing that the speed of B relative to A is 10 km/h:

$$v_{\mathrm{B||A}} = v_{\mathrm{A}} \cos 30° + v_{\mathrm{B}},$$

$$v_{\mathrm{B}} = v_{\mathrm{B||A}} - v_{\mathrm{A}} \cos 30° = 10 - 12 \cos 30° = -0.39 \ \frac{\mathrm{km}}{\mathrm{h}}.$$

since the ship B moves opposite to A.

Let us find the direction of a ship B relative to A:

$$\beta = 30° - 180° = -150°.$$

Answer

-0.39 km/h; -150°.