

Use the given scale to find the resultant in each of the following questions. Remember to draw arrows to represent the vectors and label your diagrams.

1. Calculate the displacement of a car drives 26 km [E], then 42 km [E30°N], and finally 35 [E75°S]. Use a scale of 1 cm = 7.0 km. (64 km [E11°S])
2. Calculate the resultant displacement of a plane that flies 250 km [W25°N], then 175 km [E75°N], and finally 425 km [E85°S]. Use a scale of 1 cm = 50 km. (191 km [E51°S])
3. A river flows 7.5 m/s directly east to west. To cross the river a boat is sailed 10 m/s [W60°N]. Calculate the resulting velocity of the boat using a scale of 1 cm = 1 m/s. (9.1 m/s [E75°N])
4. A plane is attempting to land on a runway that is lined up with north; however, there exists a 35 m/s crosswind blowing from the east. To compensate the pilot flies the plane 75 m/s [E65°N] in the air. Use a scale of 1 cm = 8.0 m/s to calculate the resulting velocity of the plane relative to someone watching from the ground. (65 m/s [E88°N])
5. **Challenge:** Take the situation from question 4. The crosswind is 25 m/s and the pilot wants to be sure the plane's resultant velocity is 60 m/s [N]. Calculate what velocity the pilot must make the plane in the air. Use a scale of 1 cm = 6 m/s. (65 m/s [E67°N])