Calculus 3 – Sep 2, 2003

Take out a 8 1/2 by 11 piece of paper
Write your name and today's date on it
Rules:
Show **ALL** work for credit; be neat. Calculators can be used for graphing and calculating only. Give exact answers when possible.

Problem

A woman walks due west on a deck of a ship at 5 m/s. The ship is moving north at a speed of 12 m/s. Find the speed and the velocity of the woman relative to the surface of the water.

Solution

$\vec{s} = \langle 0, 12 \rangle$ **m/s ship**

$\vec{w} = \langle -5, 0 \rangle$ **m/s women with resp. ship**

velocity $= \vec{s} + \vec{w} = \langle -5, 12 \rangle$ **m/s.**

speed $= \sqrt{5^2 + 12^2} = \sqrt{25 + 144} = \sqrt{169} = 13$ **m/s.**