With respect to the water's surface, the woman's velocity is the vector sum of the velocity of the ship with respect to the water, and the woman's velocity with respect to the ship. If we let north be the positive $y$-direction, then $\mathbf{v} = \langle 0, 24 \rangle + \langle -4, 0 \rangle = \langle -4, 24 \rangle$. The woman's speed is $|\mathbf{v}| = \sqrt{16 + 576} \approx 24.3$ mi/h. The vector $\mathbf{v}$ makes an angle $\theta$ with the east, where $\theta = \arctan\left(\frac{24}{-4}\right) \approx 99.5°$. Therefore, the woman's direction is about $\text{N}(99.5 - 90)°\text{W} = \text{N}9.5°\text{W}$.