Quiz 4

$\bar{u} = \langle 1, 1, 2 \rangle, \quad \bar{v} = \langle 1, -1, 2 \rangle$

1. $\bar{u} \times \bar{v} = \begin{vmatrix} i & j & k \\ 1 & 1 & 2 \\ 1 & -1 & 2 \end{vmatrix} = \langle 4, 0, -2 \rangle$

2. (a) Area of ▱ is

$|\langle 4, 0, -2 \rangle| = \sqrt{16+4} = \sqrt{20}$

(b) unit vectors $\bar{w} \perp$ to $\bar{u}, \bar{v}$ have direction $\pm \bar{u} \times \bar{v}$, so

$\bar{w} = \dfrac{\langle 4, 0, -2 \rangle}{\sqrt{20}} = \left\langle \dfrac{2}{\sqrt{5}}, 0, \dfrac{-1}{\sqrt{5}} \right\rangle$ or

$\left\langle -2/\sqrt{5}, 0, \dfrac{1}{\sqrt{5}} \right\rangle$