1)

$\vec{A} \cdot \vec{B} = 17$

$|\vec{A}| = \sqrt{65}$

$|\vec{B}| = \sqrt{5}$

$17 = \sqrt{325}\cos\theta$

$\theta = \cos^{-1}\left(\frac{17}{\sqrt{325}}\right) = \boxed{0.34 \text{ rad}}$

2)

$\vec{PQ} = \vec{Q} - \vec{P} = [-a, 0, 2]$

$\vec{QR} = \vec{R} - \vec{Q} = [a, -2, 2]$

$\vec{PQ} \cdot \vec{QR} = 4 - a^2$

$|\vec{PQ}| = \sqrt{a^2+4}$

$|\vec{QR}| = \sqrt{a^2+8}$

$4 - a^2 = \sqrt{(a^2+4)(a^2+8)}\cos\theta$

$\theta = \cos^{-1}\left(\frac{4-a^2}{\sqrt{(a^2+4)(a^2+8)}}\right)$

$\frac{\pi}{2} = \cos^{-1}\left(\frac{4-a^2}{\sqrt{(a^2+4)(a^2+8)}}\right) \Rightarrow \boxed{a = -2, 2}$

3)

?