

Quiz #1

$$1) \vec{u} \cdot \vec{v} = 0 \Rightarrow a + 4a + 8 = 0 \Rightarrow \boxed{a = -\frac{8}{5}}$$

(6)

$$2) P = (1, -5, 2), Q = (-1, -3, 3), R = (-3, -1, 5)$$

$$\left. \begin{array}{l} \vec{PQ} = \langle -2, 2, 1 \rangle \\ \vec{PR} = \langle -4, 4, 3 \rangle \end{array} \right\} \Rightarrow \vec{PQ} \times \vec{PR} = 2\vec{i} + 2\vec{j} = \langle 2, 2, 0 \rangle$$

Since $\vec{PQ} \times \vec{PR} \neq \vec{0}$ so three points P, Q, R do NOT lie on the same line. (6)

$$3) \vec{n} = \langle 1, 1, -1 \rangle \times \langle 2, -3, 4 \rangle = \langle 1, -6, -5 \rangle$$

So the plane is

$$\boxed{\begin{array}{l} (x-1) - 6(y-0) - 5(z+2) = 0 \\ x - 6y - 5z = 11 \end{array}}$$

(8)