

$$2.6. \quad \vec{a} = 3\vec{i} + 2\vec{j} + 2\vec{k}$$

$$\vec{b} = 18\vec{i} + 22\vec{j} - 5\vec{k}$$

$$\|\vec{r}\| = 14$$

$$\vec{r} \perp \vec{a}, \vec{r} \perp \vec{b} \quad \angle(\vec{r}, \text{Oy}) > 90^\circ$$

$$\begin{cases} \vec{r} \cdot (3\vec{i} + 2\vec{j} + 2\vec{k}) = 0 \\ \vec{r} \cdot (18\vec{i} + 22\vec{j} - 5\vec{k}) = 0 \end{cases}$$

$$\vec{r} = (r_1, r_2, r_3)$$

$$\|\vec{r}\| = 14 \Rightarrow \sqrt{r_1^2 + r_2^2 + r_3^2} = 14$$

$$\Rightarrow r_1^2 + r_2^2 + r_3^2 = 196$$

$$\begin{cases} 3r_1 + 2r_2 + 2r_3 = 0 & | \cdot 6 \\ 18r_1 + 22r_2 - 5r_3 = 0 \end{cases}$$

$$\begin{cases} 18r_1 + 12r_2 + 12r_3 = 0 \\ 18r_1 + 22r_2 - 5r_3 = 0 \end{cases} \quad (-)$$

$$34r_2 + 17r_3 = 0$$

$$\Rightarrow \boxed{r_3 = -2r_2}$$

$$3r_1 + 2r_2 - 4r_2 = 0$$

$$\Rightarrow \boxed{r_1 = \frac{2}{3}r_2}$$

$$\left(\frac{2}{3}\right)^2 r_2^2 + r_2^2 + (-2)^2 r_2^2 = 196$$

$$\Rightarrow \frac{4}{9} r_2^2 + r_2^2 + 4 r_2^2 = 196$$

$$\Rightarrow r_2^2 = \frac{9 \cdot 196}{49}$$

$$\Rightarrow r_2 = \pm 6$$

$$\text{I. } r_2 = 6 \Rightarrow r_1 = 4, r_3 = -12$$

$$r = (4\vec{i} + 6\vec{j} - 12\vec{k})$$

$$\text{II. } r_2 = -6 \Rightarrow r_1 = -4, r_3 = 12$$

$$r = (-4\vec{i} - 6\vec{j} + 12\vec{k})$$

$$\angle(\vec{r}, \vec{y}) > 90^\circ \Rightarrow \vec{r} \cdot \vec{y} < 0$$

$$\text{I. } r = (4, 6, -12)$$

$$\vec{r} \cdot \vec{y} = 4 \cdot 0 + 6 \cdot 1 + (-12) \cdot 0 = 6 > 0, "F"$$

$$\text{II. } r = (-4, -6, 12)$$

$$\vec{r} \cdot \vec{y} = (-4) \cdot 0 + (-6) \cdot 1 + 12 \cdot 0 = -6 < 0, "A"$$

$$y = \{ r = -4\vec{i} - 6\vec{j} + 12\vec{k} \}$$