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1) $\vec{u}(5, -8)$ $\vec{v}(a, 25)$
 \vec{u}, \vec{v} colinéaires $\Leftrightarrow \det(\vec{u}, \vec{v}) = 0$

$$\Leftrightarrow \begin{vmatrix} 5 & a \\ -8 & 25 \end{vmatrix} = 0$$

$$\Leftrightarrow 5 \times 25 - a \times (-8) = 0$$

$$\Leftrightarrow 125 + 8a = 0$$

$$\Leftrightarrow \boxed{a = -\frac{125}{8}}$$

2) $\vec{u}\left(\frac{3}{5}; -\frac{7}{12}\right)$ $\vec{v}\left(-\frac{2}{7}; a\right)$

\vec{u}, \vec{v} colinéaires $\Leftrightarrow \begin{vmatrix} \frac{3}{5} & -\frac{2}{7} \\ -\frac{7}{12} & a \end{vmatrix} = 0$

$$\Leftrightarrow \frac{3}{5} \times a - \left(-\frac{2}{7}\right) \times \left(-\frac{7}{12}\right) = 0$$

$$\Leftrightarrow \frac{3a}{5} - \frac{2 \times 7}{7 \times 12} = 0$$

$$\Leftrightarrow \frac{3a}{5} - \frac{1}{6} = 0$$

$$\Leftrightarrow \frac{3a}{5} = \frac{1}{6}$$

$$\Leftrightarrow 18a = 5$$

$$\Leftrightarrow \boxed{a = \frac{5}{18}}$$

3) $\vec{u}\left(\frac{3}{4}; \frac{1}{6}\right)$ $\vec{v}(a; -\frac{2}{3})$

\vec{u}, \vec{v} colinéaires $\Leftrightarrow \begin{vmatrix} \frac{3}{4} & a \\ \frac{1}{6} & -\frac{2}{3} \end{vmatrix} = 0$

$$\Leftrightarrow \frac{3}{4} \times \left(-\frac{2}{3}\right) - a \times \frac{1}{6} = 0$$

$$\Leftrightarrow -\frac{1}{2} - \frac{a}{6} = 0$$

$$\Leftrightarrow -\frac{a}{6} = +\frac{1}{2}$$

$$\Leftrightarrow -\frac{a}{6} = +\frac{3}{6}$$

$$\Leftrightarrow -a = 3$$

$$\Leftrightarrow \boxed{a = -3}$$

$$4) \vec{u} (7; 3) \quad \vec{v} (2a+5; -3a+2)$$

$$\vec{u}, \vec{v} \text{ colinéaires} \Leftrightarrow \det(\vec{u}, \vec{v}) = 0$$

$$\Leftrightarrow \begin{vmatrix} 7 & 2a+5 \\ 3 & -3a+2 \end{vmatrix} = 0$$

$$\Leftrightarrow 7(-3a+2) - 3(2a+5) = 0$$

$$\Leftrightarrow -21a + 14 - 6a - 15 = 0$$

$$\Leftrightarrow -27a - 1 = 0$$

$$\Leftrightarrow -27a = 1$$

$$\Leftrightarrow \boxed{a = -\frac{1}{27}}$$