

問8 P93

$$\begin{aligned}
 (1) \quad 3\vec{a} + 4\vec{b} &= 3(2, -3, 0) + 4(-3, 2, 5) \\
 &= (6, -9, 0) + (-12, 8, 20) \\
 &= (-6, -1, 20)
 \end{aligned}$$

$$(2) \quad 2(\vec{a} + \vec{b}) - 3(\vec{b} - 2\vec{c})$$

$$\begin{aligned}
 &= 2\vec{a} + 2\vec{b} - 3\vec{b} + 6\vec{c} \\
 &= 2\vec{a} - \vec{b} + 6\vec{c} \\
 &= 2(2, -3, 0) - (-3, 2, 5) + 6(6, 0, -3) \\
 &= (4, -6, 0) + (3, -2, -5) + (36, 0, -18) \\
 &= (7, -8, -5) + (36, 0, -18) \\
 &= (43, -8, -23)
 \end{aligned}$$

問9 P93

$$\vec{q} = l\vec{a} + m\vec{b} + n\vec{c}$$

$$\begin{aligned}
 (-2, 3, -5) &= l(1, 1, 1) + m(0, 1, -1) + n(0, 1, 0) \\
 &= (l, l + m + n, l - m)
 \end{aligned}$$

$$\begin{cases}
 l = -2 & \dots \textcircled{1} \\
 l + m + n = 3 & \dots \textcircled{2} \\
 l - m = -5 & \dots \textcircled{3}
 \end{cases}$$

$$\textcircled{1} \text{ と } \textcircled{3} \text{ を } \textcircled{2} \text{ に代入}$$

$$-2 - m = -5$$

$$-m = -3$$

$$m = 3$$

$$l = -2, m = 3 \text{ を } \textcircled{2} \text{ に代入}$$

$$-2 + 3 + n = 3$$

$$n = 2$$

$$\therefore l = -2, m = 3, n = 2$$

$$\vec{q} = l\vec{a} + m\vec{b} + n\vec{c}$$

$$\therefore \vec{q} = -2\vec{a} + 3\vec{b} + 2\vec{c}$$

問10 P94

$$\begin{aligned}
 \vec{AB} &= (-2, 8, 3) - (4, 3, -5) \\
 &= (-6, 5, 8)
 \end{aligned}$$

$$\begin{aligned}
 |\vec{AB}| &= \sqrt{(-6)^2 + 5^2 + 8^2} \\
 &= \sqrt{36 + 25 + 64} \\
 &= \sqrt{125} \\
 &= \sqrt{25 \cdot 5} \\
 &= 5\sqrt{5}
 \end{aligned}$$