14 (1) Considering symmetry, the solusions of the equation are $\alpha, \beta, \gamma = -\alpha, \delta = -\beta$,thus.

$$\begin{aligned} x^4 + ax^3 + bx^2 + cx + d &= (x-\alpha)(x-\beta)(x+\alpha)(x+\beta) \\ &= (x^2-\alpha^2)(x^2-\beta^2) \\ &= x^4 - (\alpha^2+\beta^2)x^2 + \alpha^2\beta^2 \qquad \cdots ① \end{aligned}$$

Comparing coefficients.

$$a = c = 0 \qquad \cdots ans.$$

(2)(3) by means of ①, $b = -(\alpha^2+\beta^2),\ d = \alpha^2\beta^2$,then.

$$\begin{aligned} b^2 = 3d &\iff (\alpha^2+\beta^2)^2 = 3\alpha^2\beta^2 \\ &\iff \alpha^4 - \alpha^2\beta^2 + \beta^4 = 0 \\ &\iff \left(\frac{\beta}{\alpha}\right)^4 - \left(\frac{\beta}{\alpha}\right)^2 + 1 = 0 \\ &\iff \left(\frac{\beta}{\alpha}\right)^2 = \frac{1 \pm \sqrt{3}i}{2} = \cos(\pm 60^\circ) + i\sin(\pm 60^\circ) \end{aligned}$$

Set $\beta = \alpha(\cos\theta + i\sin\theta)\ (0 < \theta < 180^\circ)$, then .

$$\cos 2\theta + i\sin 2\theta = \cos(\pm 60^\circ) + i\sin(\pm 60^\circ)$$

$$\therefore \quad \theta = 30^\circ,\ 150^\circ$$

Therefore,the angle formed by two diagonals of the rectangle $ABCD$ is.

$$30^\circ \qquad \cdots ans.$$

In addition,the length of the sides of the rectangle $ABCD$ are.

$$\frac{\sqrt{6} \pm \sqrt{2}}{2} \qquad \cdots ans.$$