

$$(5) \quad (1, 0, 0) \quad (0, 2, 0) \quad (0, 0, 3)$$

$$\langle -1, 2, 0 \rangle \quad \langle 0, -2, 3 \rangle$$

$$a(x-x_0) + b(y-y_0) + c(z-z_0) = 0$$

$$6(x-0) + 3(y-0) + 2(z-3) = 0$$

$$6x + 3y + 2z - 6 = 0$$

$$\langle -1, 2, 0 \rangle \times \langle 0, -2, 3 \rangle = \begin{vmatrix} i & j & k \\ -1 & 2 & 0 \\ 0 & -2 & 3 \end{vmatrix}$$

$$\begin{vmatrix} 2 & 0 \\ -2 & 3 \end{vmatrix} i - \begin{vmatrix} -1 & 0 \\ 0 & 3 \end{vmatrix} j + \begin{vmatrix} -1 & 2 \\ 0 & -2 \end{vmatrix} k$$

$$\langle 6, 3, 2 \rangle$$

$$\boxed{6x + 3y + 2z = 6}$$

$$(6) \quad x^2 + y^2 = 4$$

$$z = xy$$

$$x = r \cos t \quad r = 2$$

$$y = r \sin t$$

$$x = 2 \cos t$$

$$y = 2 \sin t$$

$$z = (2 \cos t)(2 \sin t)$$

$$z = 4 \sin t \cos t$$

$$z = 2 \sin 2t$$

$$r(t) = \langle 2 \cos t, 2 \sin t, 2 \sin 2t \rangle$$

$$2^2 \cos^2 t + 2^2 \sin^2 t = 4$$

$$4(\cos^2 t + \sin^2 t) = 4$$

$$4(1) = 4$$

$$4 = 4 \quad \checkmark$$

$$\boxed{r(t) = 2 \cos(t)i + 2 \sin(t)j + 2 \sin(2t)k}$$