MATB41 HW1

Question 1
Sketch the following curves.

1. $(y-1)^2 = 2x+2$
2. $x^2 - 2x + 2y^2 - 8y + 7 = 0$
3. $2x^2 - 16x - 3y + 38 = 0$
4. $9y^2 - 4x^2 - 36y - 8x = 4$

Question 2
Sketch the following surfaces.

1. $z^2 - x^2 - y^2 - 4z - 2x + 3 = 0$
2. $(\sqrt{x^2+y^2} - 2)^2 + z^2 = 1$
3. $z^2 + \sqrt{x^2+y^2} - 1 = 0$
4. $z = \sqrt{2x^2+y^2}$

Question 3
Find the determinant.

$$\begin{bmatrix} 3 & 0 & -3 \\ -2 & 0 & 4 \\ 1 & 2 & 4 \end{bmatrix}$$

Question 4
Find the length of the vectors. Find $\vec{a} \cdot \vec{b}$ and the angle between them.
$\vec{a} = (4, 0, 2)$, $\vec{b} = (2, -1, 0)$.

Question 5
Find the equation of the line or plane.

1. The line through $(1, -2, 3)$ and $(2, 0, 1)$.
2. The plane through $(1, 0, 0)$, $(0, 2, 0)$, $(0, 1, 1)$.