

1 For each of the following surfaces:

- (i) Decide whether the surface is the graph of a function  $f(x, y)$ . If so, give a possible  $f(x, y)$ . If not, explain why not.
- (ii) Decide whether the surface is a level set of a function  $F(x, y, z)$ . If so, give a possible  $F(x, y, z)$ . If not, explain why not.
- (iii) Decide whether the surface has a parametric representation. If so, give a possible  $\mathbf{r}(u, v)$ . If not, explain why not.

Here are the surfaces:

(a)  $z = x^2 + y^2$

(b)  $x = y^2 + z^2$

(c)  $2x + 3y + 4z = 12$