1. Find and sketch the domain. What dimension does the domain live in? What dimension does the graph live in?

   (a) $f(x, y) = \sqrt{2x - y}$

   (b) $f(x, y) = \sqrt{y} + \sqrt{25 - x^2 - y^2}$

   (c) $f(x, y, z) = \sqrt{x + y - z}$

   (d) $f(x, y, z) = \dfrac{1}{x^2 + y^2 + z^2}$

2. Sketch the graph of each function.

   (a) $f(x, y) = x^2 + y^2$

   (b) $f(x, y) = \sqrt{x^2 + y^2}$

   (c) $f(x, y) = 2x^2 + 5y^2$

   (d) $f(x, y) = \sqrt{4 - x^2 - y^2}$

   (e) $f(x, y) = 3 + \sqrt{4 - x^2 - y^2}$

   (f) $f(x, y) = x + y$

   (g) $f(x, y) = xy$

   (h) $f(x, y) = x^2$

   (i) $f(x, y) = 7$

3. (a) Sketch the curve given by $x^2 + y^2 = 1$ in $\mathbb{R}^2$.

   (b) Sketch the surface given by $x^2 + y^2 = 1$ in $\mathbb{R}^3$.

   (c) Sketch the curve given by $y = x^2$ in $\mathbb{R}^2$.

   (d) Sketch the surface given by $y = x^2$ in $\mathbb{R}^3$.