1.) Graph each of the following equations in two-dimensional space.
   a.) $y = 3$  
   b.) $x = -2$  
   c.) $y = x$  
   d.) $y = 3 - x$  
   e.) $y = x^3$
   f.) $y = e^x$  
   g.) $y = \ln x$  
   h.) $y = \sqrt{x}$  
   i.) $x = y^2$  
   j.) $y = \frac{1}{x}$

2.) Sketch the level curves for each of the following equations (surfaces) using the following values of $z$ : $-3, -2, -1, 0, 1, 2, 3$
   a.) $z = y$  
   b.) $z = 1 - x - y$  
   c.) $z^2 = x^2 + y^2$  
   d.) $x^2 + y^2 + z^2 = 9$

3.) Sketch all three coordinate plane traces (i.e., $x = 0$, $y = 0$, and $z = 0$) for each of the following equations (surfaces).
   a.) $x + 2y + 3z = 6$  
   b.) $z = x^2 + y^2$  
   c.) $z = y^2 - x^2$  
   d.) $z^2 = x^2 + y^2$

4.) Sketch in three-dimensional space each of the following equations (surfaces). Use intercepts, traces, and/or level curves, if necessary.
   a.) $y = 3$  
   b.) $x = -2$  
   c.) $y = x$  
   d.) $y = 3 - x$  
   e.) $y = x^3$
   f.) $y = e^x$  
   g.) $y = \ln x$  
   h.) $y = \sqrt{x}$  
   i.) $x = y^2$  
   j.) $y = \frac{1}{x}$
   k.) $x^2 + y^2 + z^2 = 4$  
   l.) $x + 2y + 3z = 6$  
   m.) $z = x^2 + y^2$  
   n.) $z^2 = x^2 + y^2$
   o.) $z^2 = x^2 + y^2 - 1$  
   p.) $z^2 = x^2 + y^2 + 1$  
   q.) $z = y^2 - x^2$

5.) a.) Consider the graph of $y = \ln(x - 1)$ in the $xy$-plane. Find an equation for the surface created by revolving this graph about the
   i.) $x$-axis  
   ii.) $y$-axis.

   b.) Consider the graph of $z = \sin x$ in the $xz$-plane. Find an equation for the surface created by revolving this graph about the
   i.) $x$-axis  
   ii.) $z$-axis.

6.) Determine and sketch the domain of each function in 2D-Space and find the range of each function.
   a.) $z = 1 + x^2 + y^2$  
   b.) $z = 1 - x^2 - y^2$
   c.) $z = 1 - x^2 + y^2$  
   d.) $z = 1 - x - y$
   e.) $f(x, y) = \sqrt{1 - x - y}$  
   f.) $f(x, y) = \sqrt{1 - x^2 - y^2}$
   g.) $f(x, y) = 5 + e^{-x^2-y^2}$  
   h.) $f(x, y) = 3 - \sqrt{y - \ln x}$
   i.) $z = 3 \cos x + 4 \sin y$  
   j.) $z = 2 - 5 \sin(\ln y)$
k.) \( z = \ln(25 - x^2 - y^2) \)  
l.) \( f(x, y) = \ln(x^2 + y^2 - 25) \)
m.) \( f(x, y) = \frac{7}{x^2 - y} \)  
n.) \( f(x, y) = \frac{7}{x^2 + y^2} \)
o.) \( f(x, y) = \frac{8}{2 + \sqrt{x - 2y}} \)  
p.) \( f(x, y) = \frac{8}{2 - \ln(x + y)} \)

7.) Determine and sketch the domain of each function in 2D-Space.

a.) \( f(x, y) = \ln(x^2 + y^2 - 4) \)  
b.) \( f(x, y) = \ln(1 + x + y) \)
c.) \( f(x, y) = \frac{1}{4 - \sqrt{25 - x^2 - y^2}} \)  
d.) \( f(x, y) = \sqrt{(x^2 - 4)(y^2 - 1)} \)

************* The following problem is for recreational purposes only. *************

8.) A snail is at the bottom of a well which is 100 feet deep. Each day the snail climbs up 7 feet and down 5 feet. In how many days will the snail reach the top of the well?