Math 367 Homework Assignment 2
SOLUTIONS

1.

    (a) (i) yes, one-to-one (ii) no, not onto
    (b) (i) no, not one-to-one (ii) yes, onto
    (c) (i) no, not one-to-one (ii) no, not onto
    (d) (i) yes, one-to-one (ii) yes, onto
    (e) (i) no, not one-to-one (ii) no, not onto

2.

    (a) $f^{-1}(x) = \sqrt[3]{\dfrac{x+1}{2}}$

    (b) $f^{-1}((x,y)) = (\tfrac{1}{2}x, \tfrac{1}{3}y)$

3.

$$
\begin{aligned}
(f \circ g)((x,y)) = f(g((x,y))) &= f((3x, -y)) \\
&= (3x+1, -y-2) \\
(g \circ f)((x,y)) = g(f((x,y))) &= g((x+1, y-2)) \\
&= (3(x+1), -(y-2)) = (3x+3, -y+2)
\end{aligned}
$$

4.

$f(T)$:   center $(2,2)$, radius 1
$g(T)$:   center $(0,0)$, radius 3
$(f \circ g)(T)$:   center $(2,2)$, radius 3