Name: _____ Class: _____ Date: _____ ID: A

Lesson #7 A: Understanding Inverses and Finding the Inverse of Relations and Functions (Reference: Lesson #50 in book)

Problem

1. **For each of the following relations (r), determine the inverse of the relation (r^{-1}), determine whether each of the relations are functions and if the have an inverse relation, and explain how you arrived at your answer.**

   1. Relation r :

x	y	(x,y)
-4	7	(-4,7)
3	-4	(3,-4)
8	1	(8,1)
-5	-2	(-5,-2)
-9	3	(-9,3)
1	7	(1,7)

   2. Relation r:

x	y	(x,y)
-1	3	(-1,3)
4	-9	(4,-9)
-8	-5	(-8,-5)
7	-3	(7,-3)
8	2	(8,2)
-11	4	(-11,4)

   3. Relation r:

x	y	(x,y)
-3	7	(-3,7)
-9	-1	(-9,-1)
5	-6	(5,-6)
7	7	(7,7)
-3	4	(-3,4)
-2	-11	(-2,-11)

4. **Find the algebraic inverse of each of the following algebraic relations.**

   4. $f(x) = \dfrac{9x - 18}{27}$

   5. $f(x) = \dfrac{4}{-x - 3} + 2$

   6. $f(x) = \sqrt{2x + 8}$

   7. $f(x) = (3x + 6)^2 + 2$

8. $f(x) = \frac{3}{4}x^3 - 3$

9. $f(x) = \sqrt[3]{2x+4} + 2$

10. **Find the inverse of each of the following relations and determine whether each relation is a function. If any inverse is not a function determine what restrictions can be placed on the domain of the original relation to make the inverse a function. (Graphing calculators can be used to help you graph the relations and determine whether or not they are functions.)**

    10. $f(x) = -\frac{2}{5}x + 6$

11. $f(x) = \sqrt{4x - 12}$

12. $f(x) = (x-4)^2 + 5$

13. $f(x) = \sqrt[3]{9x - 27}$

14. $f(x) = -3x^2 - 9$

15. $f(x) = -\frac{1}{3}x^3 - 2$