Algebra 2 Unit 4 Problem Set
Use separate paper to show all work.

Name _____Bell_____ Date Due _____

1. Use the given functions to evaluate the following expressions.

$d(x) = x - 2$ $e(x) = 2x + 5$ $f(x) = 4x^2 - 25$ $g(x) = x^2 - 3x + 2$

a. $f(x) + e(x)$

b. $g(x) - d(x)$

c. $(f \cdot e)(x)$

d. $(f + d)(-3)$

e. $(e - g)(-5)$

f. $\left(\frac{g}{d}\right)(x)$

g. $3g(x) - 2f(x)$

h. $\left(\frac{e}{f}\right)(x)$

i. $2(d \cdot e)(x)$

j. $f(g(x))$

k. $g(e(x))$

l. $f(d(x-4))$

m. $g(d(-4))$

n. $e(f(x^4))$

o. $e(g(3x+2))$

2. Find the inverse of the function $y = x^2 - 2$. Is the inverse a function?

3. Find the inverse of the function $y = 4x - 7.$ Is the inverse a function?

4. Find the inverse of the function $y = \sqrt{x+9}$. Is the inverse a function?

5. Let $f(x) = \sqrt{2x+2}$. Find f^{-1}. Is f^{-1} a function? Find the domain and range of f and f^{-1}.

6. Let $f(x) = 2x^2 - 1$. Find f^{-1}. Is f^{-1} a function? Find the domain and range of f and f^{-1}.

7. For the function $f(x) = \frac{1}{2}x + 5$, find $(f^{-1} \circ f)(652)$ and $(f \circ f^{-})(-\sqrt{86})$.

8. For the function $f(x) = 5x + 8$, find $(f^{-1} \circ f)(59)$ and $(f \circ f^{-})(3001)$.

9. Describe the end behavior and draw a sketch graph of the general shape. Include number of possible turns.

a. $x^3 + 5x - 2$ b. $-x^2 + 6x + 7$ c. $-5x^4 - 3x^2 + 6x - 1$

Solve each equation using the indicated method.

10. Factoring

a. $23p = 5p^2 + 24$ b. $6x^2 = 16x - 8$ c. $s^2 = 56s - s^3$

11. Square roots

a. $3x^2 = 147$ b. $2x^2 - 31 = 769$ c. $\frac{1}{5}x^2 + 32 = 157$

12. Zeros from the calculator (round to the nearest 10^{th} if necessary). Find the maximum/minimum of the function.

a. $x^2 + 4x - 8 = 0$ b. $x^2 - 6x + 4 = 0$ c. $x^2 + 10x + 17 = 0$

13. Solve by completing the square. Leave answers in simplest radical form.

a. $x^2 - 6x - 16 = 0$ b. $x^2 - 14x + 74 = 0$ c. $x^2 + 8x - 11 = 0$

14. Solve using the Quadratic Formula. Leave answers in simplest radical form.

a. $6x^2 + 19x + 8 = 0$ b. $x^2 - 2x - 11 = 0$ c. $x^2 - 2x - 15 = 0$

Solve using the Quadratic Formula. Leave answers in simplest radical form.

d. $3x^2 - 7x + 5 = 0$ e. $5x^2 + 7 = 0$ f. $2x^2 - 7x + 13 = 0$

15. Find the value of the discriminant. Tell how many and what type of solutions each equations has.

a. $2x^2 - 5x + 7 = 0$ b. $-3x^2 + 14x - 8 = 0$ c. $4x^2 - 5x + 10 = 7x + 1$