Name: Key Date: _____ Period: _____

LT AA2: Study Guide

AA2

Identify the parent function, be able to graph, explain the transformation, and the significance of the locator point (h, k)

1. $y = 2(x-5)^2 + 7$ Quadratic, stretch (2), right 5, up 7, vertex (5, 7)
2. $y = |x+6| - 3$ absolute value, Left 6, down 3, vertex (-6, -3)
3. $y = -(x+9)^3 - 12$ cubic, flip, Left 9, down 12, (-9, -12) P.O.I.
4. $y = \frac{1}{4}\sqrt{x+1} - 5$ square root, compress $(\frac{1}{4})$, Left 1, down 5, starting pt (-1, -5)
5. $x = .75(y-2)^2 + 1$ vertex (1, 2), sleeping parabola, right 1, up 2
6. $(x-6)^2 + (y+4)^2 = 25$ circle, center (6, -4) r = 5

Write the equation of the function using the given information (you must show your work)

7. A parabola that has a vertex at $(1,1)$ that goes through the point $(-4,76)$ $y = 3(x-1)^3 + 1$
8. A cubic function that has a locator point at $(-3,5)$ and goes through the point $(-2,4)$ $y = -(x+3)^3 + 5$
9. An absolute value function with the vertex $(5,-4)$ that goes through the point $(-1,8)$. $y = 2|x-5| - 4$

7.) $76 = a(-4-1)^2 + 1$
$-1 \quad -1$
$75 = a(-5)^2$
$\frac{75}{25} = \frac{25a}{25}$
$3 = a$

8.) $4 = a(-2+3)^3 + 5$
$-5 \quad -5$
$-1 = a(1)^3$
$-1 = a$

Sketch a careful graph of each function

10. $y = (x+3)^2 - 27$ on back
11. $y = \sqrt{x+16} - 6$ on back
12. $y = 3|x+4| - 3$ on back
13. $(x-2)^2 + (y+4)^2 = 16$ on back

Use completing the square to rewrite the equation in vertex form, then identify the vertex and find the x-intercepts.

14. $y = x^2 - 24x + 16$ $x^2 - 24x + 144 + 16 - 144$, $\frac{-24}{2} = (-12)^2 = 144$, $y = (x-12)^2 - 128$, $(12, -128)$
15. $y = x^2 - 6x - 2$ $x^2 - 6x + 9 - 2 - 9$, $y = (x-3)^2 - 11$, $V = (3, -11)$, $(\frac{-6}{2})^2 = (-3)^2 = 9$

Find the vertex and describe the transformation

16. $x = (y+1)^2 - 3$ V = (-3, -1) Left 3, down 1
17. $x = (y-12)^2 + 7$ V = (7, 12) right 7, up 12
18. Be able to graph a piecewise function

$$\begin{cases} 4x - 2, & x \geq 2 \\ \frac{-1}{3}x + 4, & x < 2 \end{cases}$$

on back

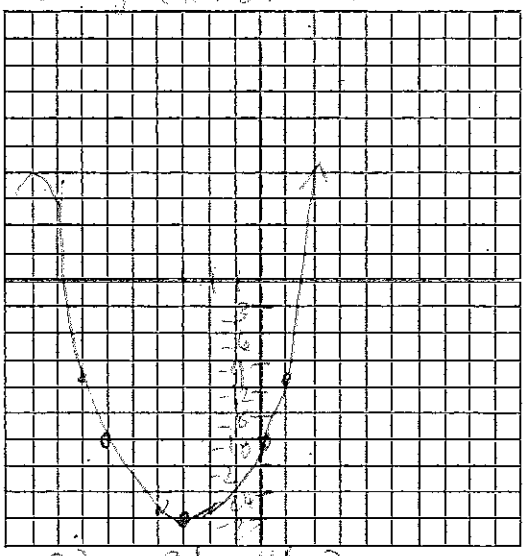
19. Be able to compare and contrast a parent function and it's transformed function. For instance how are $y = |x|$ and $y = -2|x+5| - 3$ the same and different.

Both are absolute value and will create a V. The second will be flipped, stretched 2 units vertically, moved 5 left and down 3.

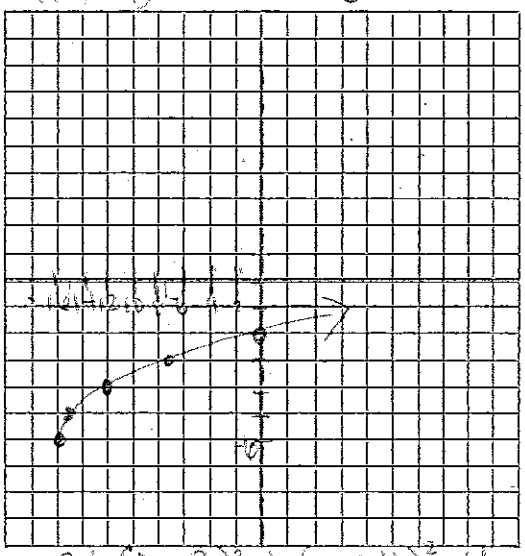
9.) $8 = a|-1-5| - 4$
$+4 \quad +4$
$12 = a|-6|$
$\frac{12}{6} = \frac{6a}{6}$
$2 = a$

V: $-3, -27$

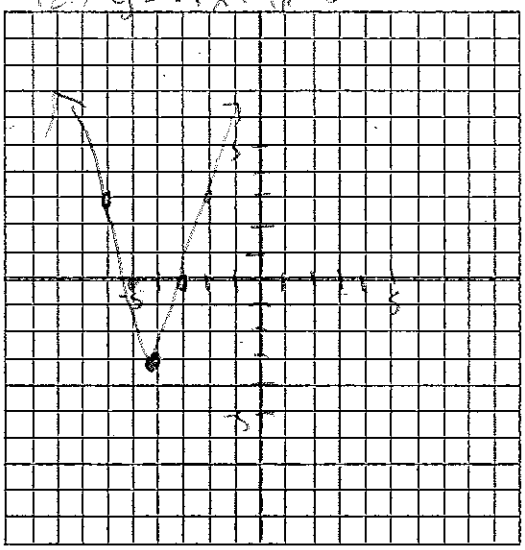
10.) $y = (x+3)^2 - 27$



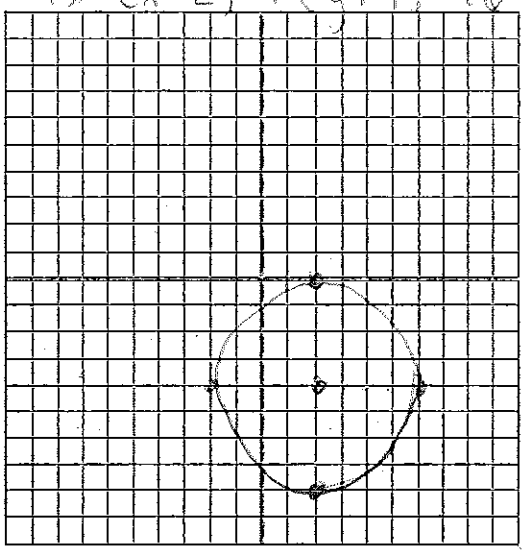
11.) $y = \sqrt{x+16} - 6$



12.) $y = 3|x+4| - 3$



13.) $(x-2)^2 + (y+4)^2 = 16$



$C = (2, -4)$

$r = \sqrt{16} = 4$