TRANSFORMATIONS OF QUADRATIC FUNCTIONS

Describe the transformation of the parent graph $y = x^2$ for each of the following:

1) $y = (x-1)^2 + 2$ ~~Down~~ Rt 1 Up 2

2) $y = -(x-2)^2 - 1$ X-axis reflection, Right 2, Down 1

3) $y = -2(x+3)^2 - 4$ X-axis Reflection, Vert stretch of 2, Left 3, Down 4

4) $y = 3(x+4)^2 + 5$ vert stretch of 3, Left 4, Up 5

5) $y = -\dfrac{1}{3}(x+1)^2 + 3$ X-axis reflection, vert Shrink by 1/3, Left 1, Up 3

6) $y = \dfrac{1}{4}(x-3)^2$ vert shrink by 1/4, Right 3

Write the equation in vertex form of the quadratic with the following transformations:

7) shift left 4 and up 3 $y = \underline{}(x-\underline{4})^2 + \underline{3}$ $y = (x-4)^2 + 3$

8) reflect over the x-axis and stretch by 2 $y = \underline{-2}(x - \underline{0})^2 + \underline{0}$ $y = -2x^2$
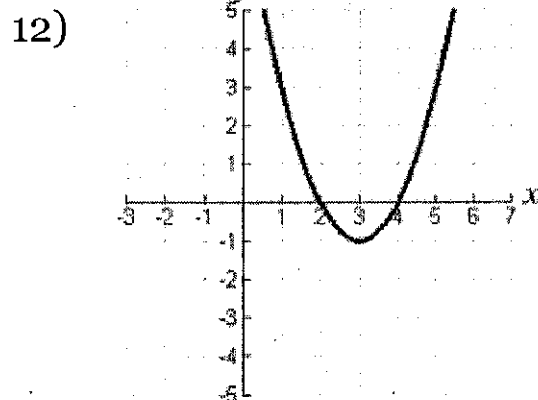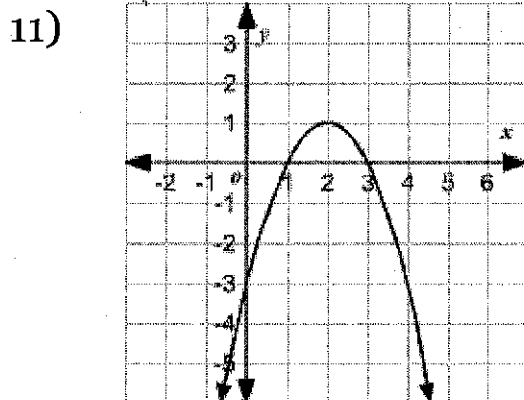
9) shrink by $\dfrac{1}{3}$ and shift right 2 $y = \dfrac{1}{3}(x-2)^2$

10) shift down 9 $y = x^2 - 9$

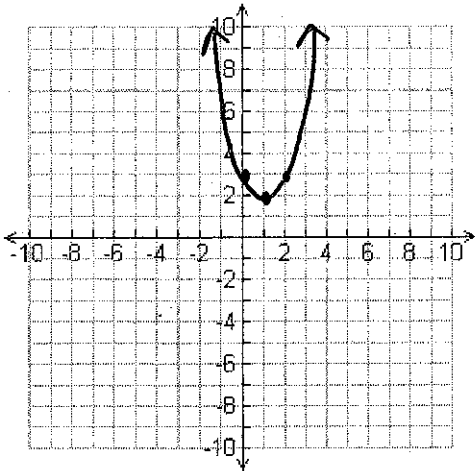**Describe the transformations from the parent graph & write an equation for the quadratic function:**

$y = \underline{-}(x - \underline{2})^2 + \underline{1}$ $y = -(x-2)^2 + 1$ $y = (x-3)^2 - 1$

11)

12)

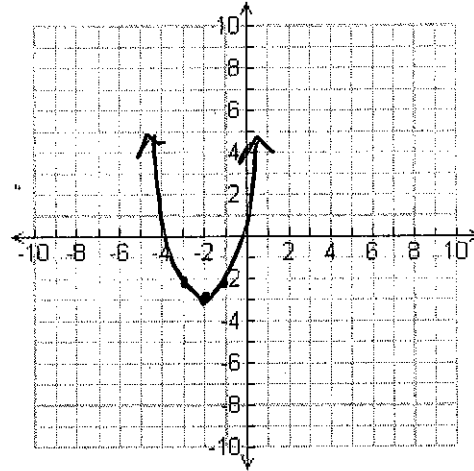Graph the following quadratic functions. State the domain and range.

13) $y = (x-1)^2 + 2$

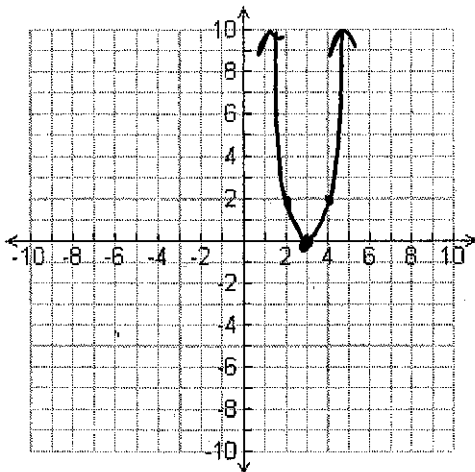

Domain: $(-\infty, \infty)$

Range: $[2, \infty)$

14) $y = (x+2)^2 - 3$

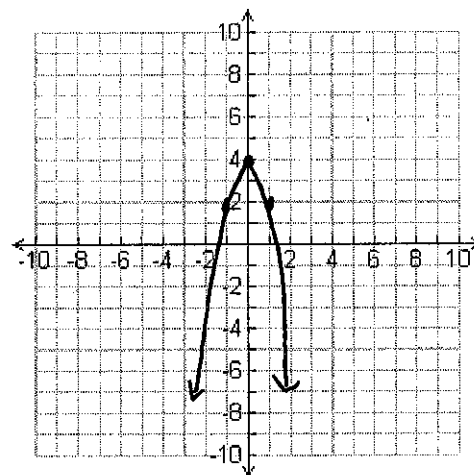Domain: $(-\infty, \infty)$

Range: $[-2, \infty)$

15) $y = 2(x-3)^2$

Domain: $(-\infty, \infty)$

Range: $[0, \infty)$

16) $y = -2x^2 + 4$

Domain: $(-\infty, \infty)$

Range: $(-\infty, 4]$