Name: Key

9.3 Transformations of Quadratic Functions

Describe how the graph of each function is related to the graph of $f(x) = x^2$ {translations, reflections, dilations}

1. $g(x) = (10 + x)^2$ or $(x + 10)^2$

T: left 10
R: none
D: normal

2. $g(x) = -\frac{2}{5} + x^2$ or $x^2 - \frac{2}{5}$

T: Down $-2/5$
R: none
D: normal

3. $g(x) = 9 - x^2$

T: up 9
R: yes; x-axis
D: normal

4. $g(x) = 2x^2 + 2$

T: up 2
R: none
D: Vert stretch

5. $g(x) = -\frac{3}{4}x^2 - \frac{1}{2}$

T: Down $-1/2$
R: yes; x-axis
D: Vert compression

6. $g(x) = -3(x + 4)^2$

T: Left 4
R: yes; x-axis
D: Vert stretch

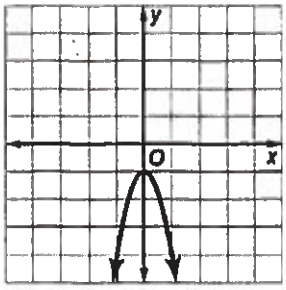
Match each equation to its graph.

7. $y = -3x^2 - 1$ A

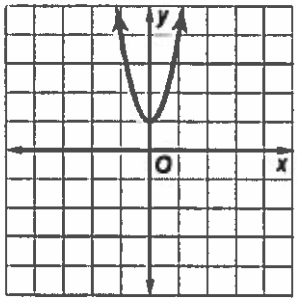
8. $y = \frac{1}{3}x^2 - 1$ C

9. $y = 3x^2 + 1$ B

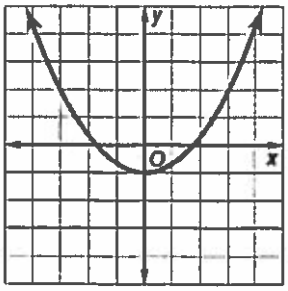
A.



B.



C.



List the functions in order from the most vertically stretched to the least vertically stretched graph.

10. $f(x) = 3x^2$, $g(x) = \frac{1}{2}x^2$, $h(x) = -2x^2$

$f(x), h(x), g(x)$

11. $f(x) = \frac{1}{2}x^2$, $g(x) = -\frac{1}{6}x^2$, $h(x) = 4x^2$

$h(x), f(x), g(x)$

Find the domain and range.

12. $g(x) = -x^2 + 3$

D: $\mathbb{R}$

R: vertex is $(0, 3)$ down

$y \leq 3$

13. $g(x) = 4(x - 1)^2$

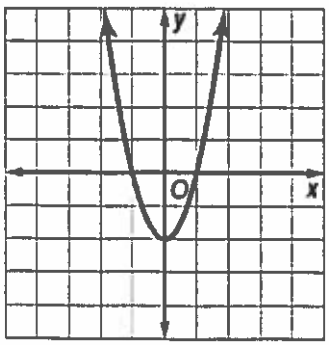
D: $\mathbb{R}$

R: v is $(1, 0)$ up

$y \geq 0$

14.

D: $\mathbb{R}$
R: $y \geq 2$



15.

D: $\mathbb{R}$
R: $y \leq 2$