Identify and compare the domain and range of $f(x) = (0.5x + 1) - 2$ and the domain and range of $g(x) = -0.5(x + 1)^2 - 2$. Write the domain and range of each function as inequalities, as intervals, and in set builder notation.

PRACTICE/HOMEWORK

1. For the quadratic function $y = a(bx - c)^2 + d$, which of the parameter values (a, b, c, or d) will produce the transformation described?
- horizontal stretch or compression
- a translation upward or downward
- vertical stretch or compression
- a translation left or right

For questions 2 - 7, describe what transformations of the quadratic parent function, $f(x) = x^2$ will result in the graph of the given function.

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

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

4. $g(x) = (4x - 7)^2$

5. $h(x) = \left(\frac{1}{2}x\right)^2 - 1$

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

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

8. The graph of $g(x)$ is produced by transforming the quadratic parent function, $f(x) = x^2$, by vertically stretching its graph by a factor of 3 and translating it 7.5 units upward. Determine the equation that represents $g(x)$.

9. The graph of $h(x)$ is produced by transforming the quadratic parent function, $f(x) = x^2$, by reflecting its graph over the x-axis, and translating it 3 units to the left and 11 units downward. Determine the equation that represents $h(x)$.

For each quadratic function given in questions 10 – 12 identify the vertex, and determine whether it is a maximum or a minimum value.

10. $g(x) = -(x - 1.5)^2 - 4$

11. $g(x) = -3(4x)^2 + 7$

12. $g(x) = (2x - 5)^2 + 3$

For questions 13 – 17 identify the domain, range, x-intercept(s), y-intercept, and vertex of each quadratic function. Write the domain and range in three different ways: as an inequality, interval, and in set-builder notation.
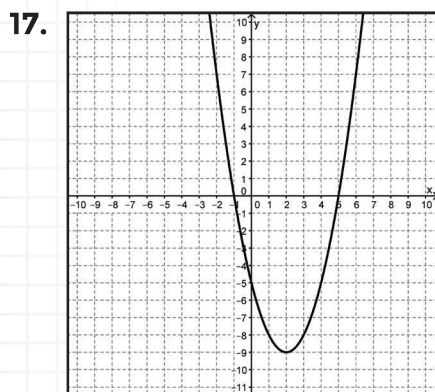
13.

$$h(x) = -\left(\frac{1}{2}x - 3\right)^2 - 1$$
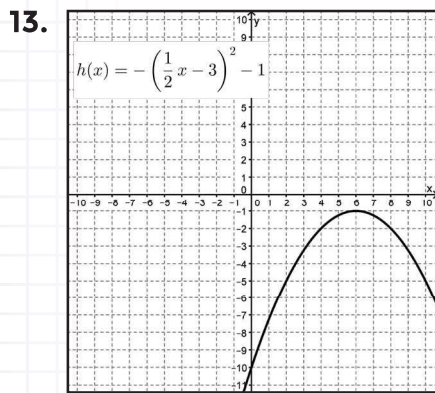
14.

x	$f(x) = -(x + 1)^2 + 9$
-5	-7
-4	0
-3	5
-2	8
-1	9
0	8
1	5
2	0

15. $g(x) = 2(x + 1)^2 - 8$

16.

x	$g(x) = 2(x + 3)^2 - 5$
-5	3
-4	-3
-3	-5
-2	-3
-1	3
0	13
1	27

17.

For questions 18 – 19 identify and compare the x-intercepts of the following sets of functions:

18. $f(x) = 3(x - 3)$ and $g(x) = (x - 1)^2 - 4$

19. $f(x) = -(x + 6)^2$ and $h(x) = -0.5(x + 6) - 1$

For questions 20 – 21 identify and compare the y-intercepts of the following sets of functions:

20. $h(x) = 2(x + 3)^2 - 1$ and $g(x) = 2(x + 3) - 1$

21. $f(x) = \frac{1}{3}(x - 6) - 3$ and $g(x) = -4\left(x - \frac{1}{2}\right)^2$

For questions 22 – 23 identify and compare the domain and range of the following sets of functions:

22. $g(x) = \frac{1}{2}(x + 4)^2 + 3$ and $f(x) = \frac{1}{2}(x + 4) + 3$

23. $h(x) = -(2x - 1)^2 + 6$ and $f(x) - (2x - 1) + 6$