Graphing Quadratics - Practice (and solutions)

The graph of a quadratic function, $f(x) = ax^2 + bx + c$, is a parabola:

1. The axis of symmetry is the line

$$x = \frac{-b}{2a}$$

2. The vertex lies on the axis of symmetry. The *y*-coordinate of the vertex is

$$f\left(\frac{-b}{2a}\right)$$

3. If $a > 0$ the parabola opens upward. If $a < 0$ the parabola opens downward.
4. The *x*-intercept(s), if any, are found by setting $f(x) = 0$, and solving $ax^2 + bx + c = 0$
5. To find the *y*-intercept, set $x = 0$ and solve for *y*.
6. If the parabola opens upward, then the *y*-value at the vertex is a minimum value.

   If the parabola opens downward, then the *y*-value at the vertex is a maximum value.

For each function, find the axis of symmetry, vertex, y-intercept, and x-intercept(s), if any. Determine the domain and range for the function. State whether the function has a relative maximum or minimum, and state the value of the max or min. Sketch the graph of the equation.

1. $f(x) = x^2 - 6x + 7$
2. $g(x) = 3x^2 + 2$
3. $y = x^2 + 6x - 5$
4. $h(t) = -t^2 - 4t + 12$
5. $k(x) = 4x - 6 + 2x^2$
6. $f(x) = -2x^2 + 7x - 5$
7. $f(x) = 3x^2 + 2x + 2$
8. $y = x^2 - 6x + 5$
9. $s(t) = -16t^2 + 48t + 8$
10. $f(x) = x^2 + 2x - 8$
11. $f(x) = -x^2 + 6x - 8$
12. $f(x) = 6 + 2x - x^2$
13. $f(x) = -2x^2 + x + 1$