Graphs of Functions (key)

1. All are true except the 3rd one. If a graph had two or more \( y \)-intercepts then it would fail the Vertical Line Test and would not be a function.

2. \( f(x) \) : The domain and range are both all real numbers, or \( (-\infty, \infty) \).
\( g(x) \) : The domain is \(-3 \leq x \leq 2\) or \([-3, -2]\). The range is \(0 \leq y \leq 4\) or \([0, 4]\).
\( h(x) \) : The domain is \(x \geq -3\) or \([-3, \infty)\). The range is \(y > 0\) or \((0, \infty)\).

3. Maximums are at the top of the hills, minimums are at the bottom. Uphill (when moving left-to-right) is increasing, while downhill is decreasing.

4.

5. \( f(-x) = (-x)^2 - 1 = x^2 - 1 = f(x) \) so \( x^2 - 1 \) must be an even function.

6. \( f(x) = x^3 + 0.01 \)
\( f(-x) = (-x)^3 + 0.01 = -x^3 + 0.01 \). Since \( f(-x) \neq f(x) \), \( f(x) \) is not even.
\( -f(x) = -(x^3 + 0.01) = -x^3 - 0.01 \). Since \( f(-x) \neq -f(x) \), \( f(x) \) is not odd either.