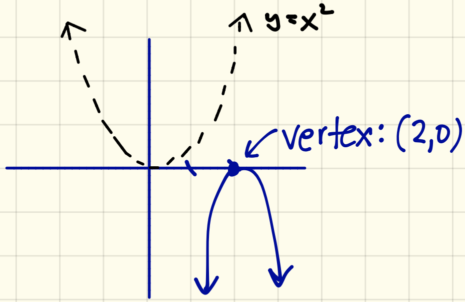
6.6 Characteristics of Polynomials

Domain, Range, Zeros, Y-intercepts, Extrema, Interval of Increase, Interval of Decrease, Axis of Symmetry, Vertex

[old] Transformations of Quadratics

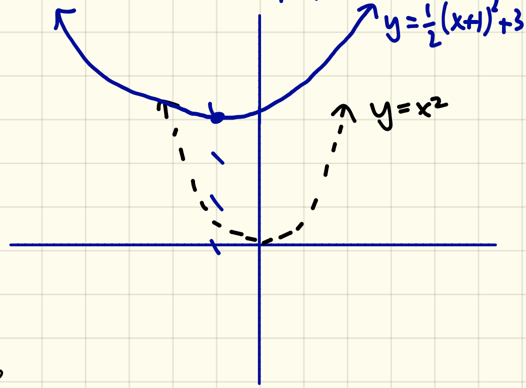
① $f(x) = -3(x-2)^2$

shift right 2, stretch, ↷



② $f(x) = \frac{1}{2}(x+1)^2 + 3$

Shift left 1, up 3, shrink



[new] Characteristics of Polynomials

- Domain: the set of x-values (how far left to right the graph spans)
- Range: the set of y-values (how far down to up the graph spans)
- Zeros: the x-intercept(s) of the graph (also called roots or solutions)
- y-intercept: the point where the graph crosses the y-axis
- Extrema: the maximum or minimum point, ← maximum ← minimum
- Interval of Increase: the set of x-values where the slopes are positive.
- Interval of Decrease: the set of x-values where the slopes are negative
- Absolute Extrema: the highest or lowest point of the graph

End Behavior

Even Degree Polynomials have end behavior like ↖ ↗ or ↙ ↘.

↳ If the leading coefficient is positive, the end behavior is ↖ ↗

↳ If the leading coefficient is negative, the end behavior is ↙ ↘

Odd Degree Polynomials have end behavior like ↙ ↗ or ↖ ↘

↳ If the leading coefficient is positive, the end behavior is ↙ ↗

↳ If the leading coefficient is negative, the end behavior is ↖ ↘