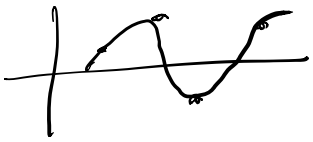
MATH 2B Review: Graphing Functions

Facts to Know:

Graphs of Basic Functions: $1/x^2$, $1/x$, x, x^2, x^3, ... e^x, $\ln(x)$ $\sqrt{x}$

trig functions: $\sin(x)$, $\cos(x)$, $\tan(x)$

Plotting Points: plugging values into a function and connecting the resulting points



Graph Transformations: If we have a graph of $f(x)$, obtain transformed graphs by

- $f(x)+c$: shift upward by c units
- $f(x+c)$: shift left by c units

} if c is negative, reverse direction

- $cf(x)$: stretch vertically by a factor of c
- $f(cx)$: shrink horizontally by a factor of c

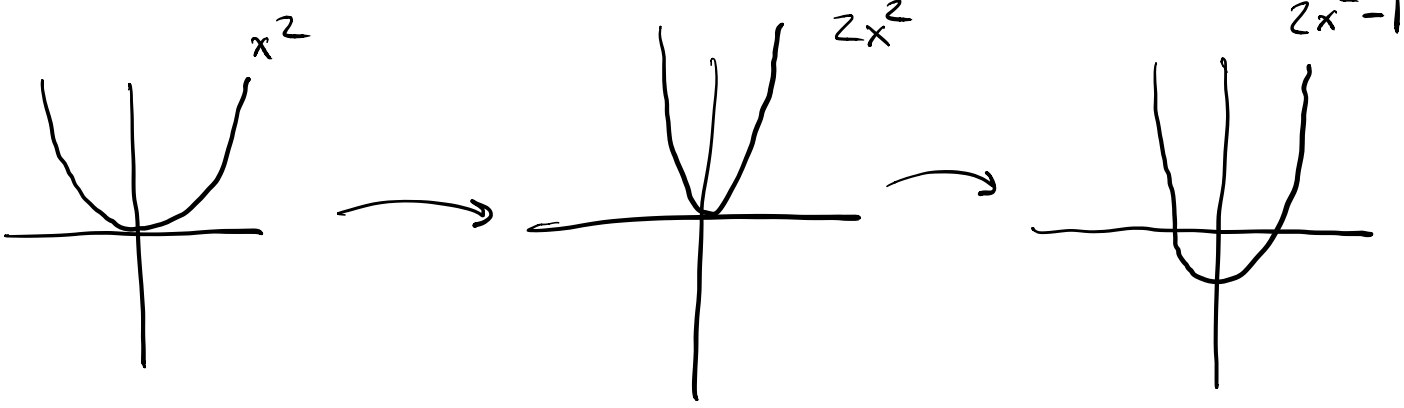
Inverse Functions: Flipping the graph of the original function over the line $y=x$

Examples:

1. Graph the function $2x^2 - 1$.

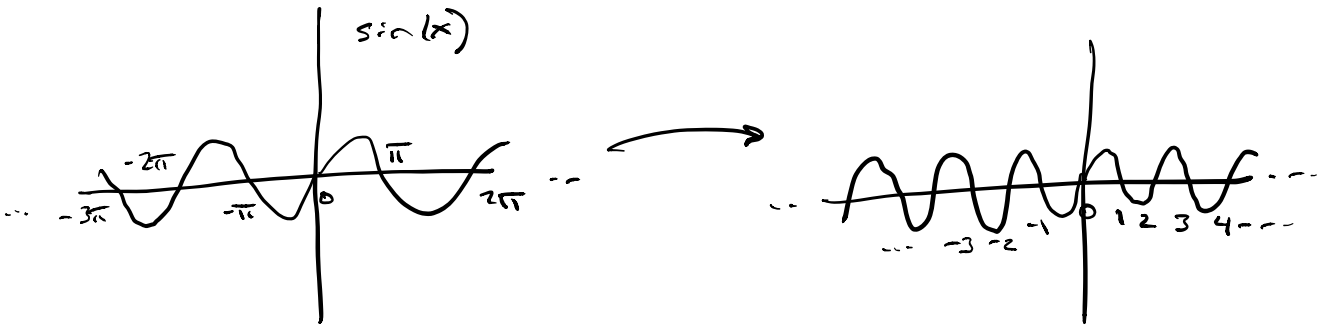
← shift downward

= ↑ vertical stretch



2. Graph the function $\sin(\pi x)$.

↑ shrink horizontally by a factor of π



3. Using the graph of $\tan(x)$, graph $\arctan(x) = \tan^{-1}(x)$.