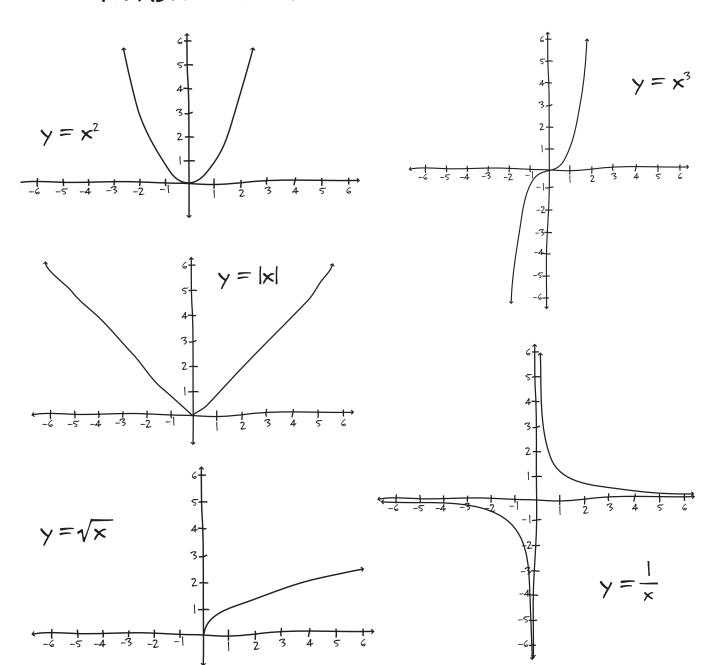
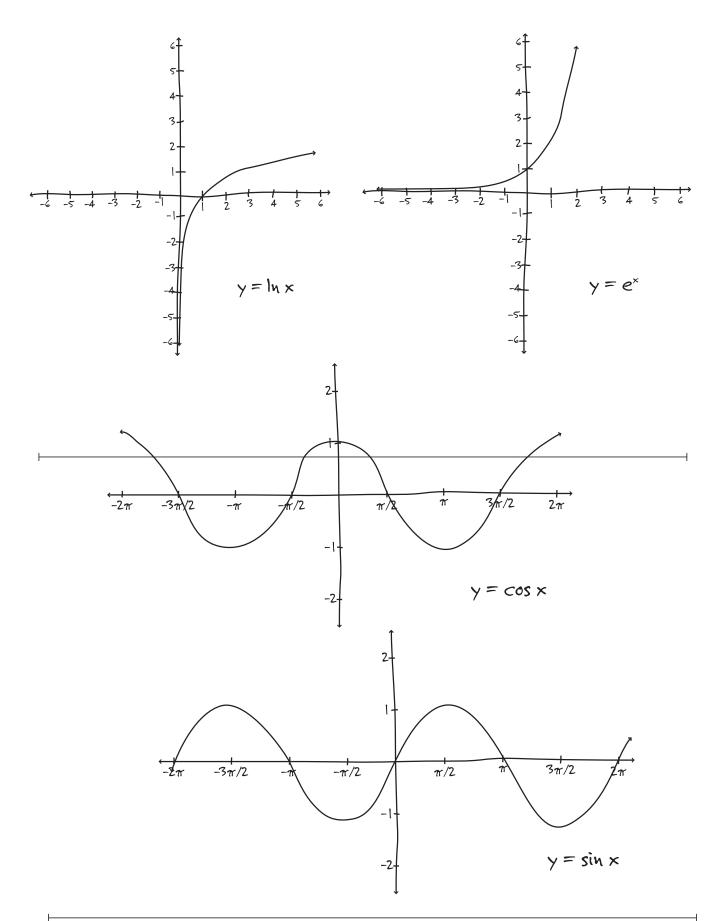
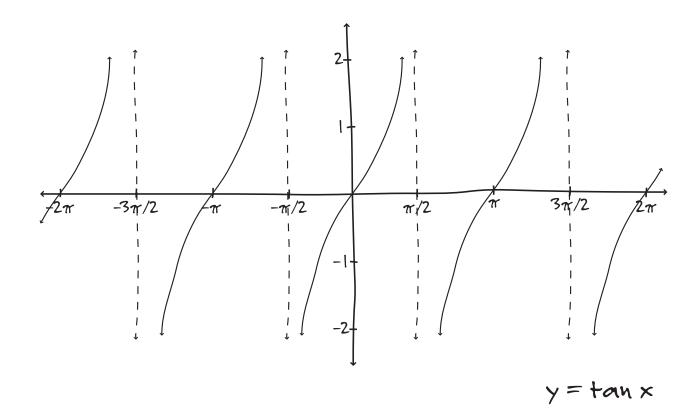
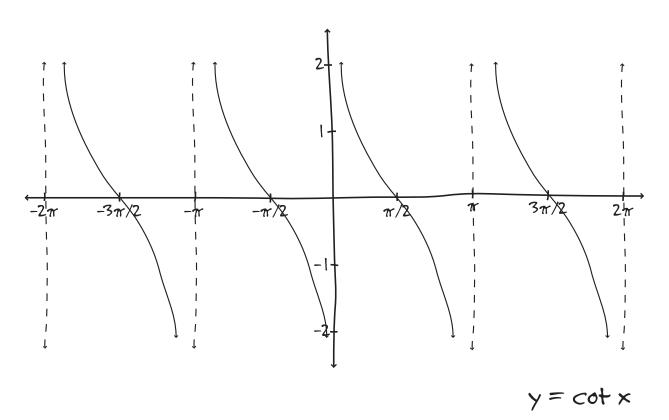
Appendix A

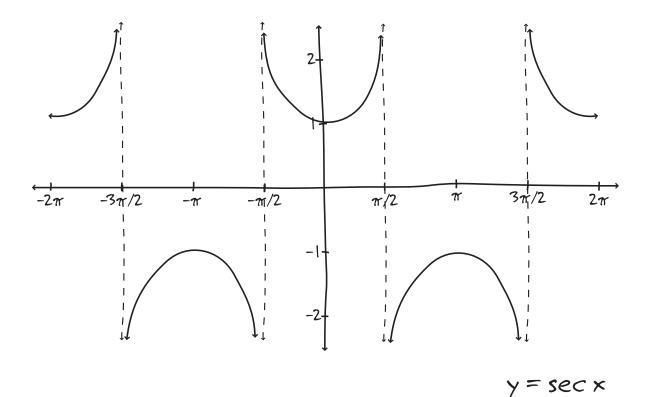
Important graphs to memorize and graph transformations

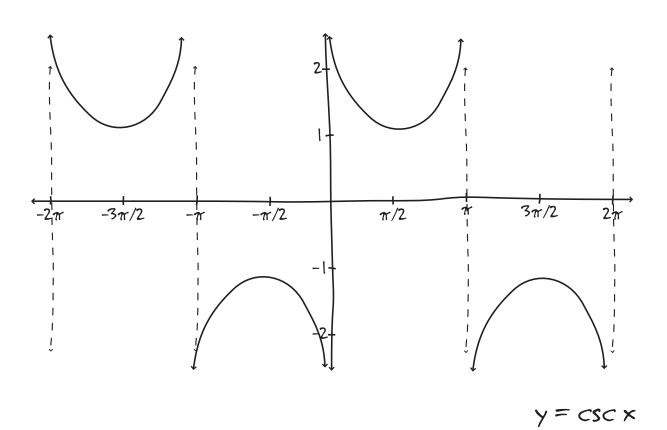












How constants transform a function graph

Absolute value of $a \cdot f(bx + c) + d$ reflects portions of f(x)below the x-axis across the x-axis b > 1: squishes f(x) horizontally 0 < b < 1: stretches f(x) horizontally -1 < b < 0: flips f(x) over y-axis and stretches it horizontally b < -1: flips f(x) over y-axis and squishes it horizontally $\overline{c>0}$: shifts graph of f(x) to the left C < 0: shifts graph of f(x) to the right $y = a \cdot f(bx + c) + d$ a > 1: stretches f(x) vertically a > 0: shifts graph of f(x) up 0 < a < 1: squishes f(x) vertically a < 0: shifts graph of f(x) down -1 < a < 0: flips f(x) over x-axis and squishes it vertically a<-1: flips f(x) over x-axis and stretches it vertically Absolute value of (bx + c) erases graph left of y-axis and replaces it with reflection of f(x) across the y-axis