**Summary 2: Functions**

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| **Vertical Line Test:** if every vertical line intersects graph at most once, the graph represents a function**Piecewise Defined Functions:** Most functions are defined in a single expression, but more complicated functions are defined in multiple cases.**Function Catalog**: We know the basic shape of the following functions:*(1) linear*: graph is straight line*(2) power*: graph is like a parabola (even) or a third degree power (odd)*(3) polynomial*: graph is wavy with finitely many mins and max*(4) rational:* graph usually has horizontal and/or vertical asymptotes*(5) trig:* graph is periodic, i.e. it repeats*(6) exp, logarithm:* either grows or shrinks super-fast |  $$f\left(x\right)=\left\{\begin{matrix}x-1 if x<-1 \\2-x^{2} if-1\leq x<2\\\frac{x}{x-1} if x\geq 2 \end{matrix}\right.$$ |