

Pre-AP PreCalculus Parent Functions

Notes Unit 1 Day 6

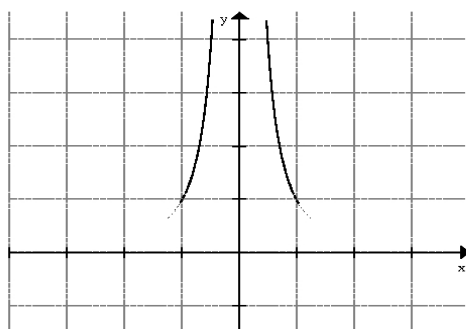
The Parent Function $f(x) = \frac{1}{x^2}$

Type: This is a special type of rational function with constant in the numerator and a denominator of degree two. I have seen some text call this function the inverse square function, but not to be confused with the inverse of a function.

Numerical (Data)

x	f(x)
0	
1	
-1	
2	
-2	
.5	
-.5	

Graph(Visual)



Unique Characteristics

Let the pivot point be the intersection of the asymptotes at (0,0)

Properties of the Parent Function

One to one: yes no **Domain:** $(-\infty, 0) \cup (0, +\infty)$ **Range:** $(0, +\infty)$

Increasing interval: $(-\infty, 0)$ **Justification:** When $x_1 < x_2$, then $f(x_1)$ $f(x_2)$
Notice: The slope of the tangent line is .

Decreasing interval: $(0, +\infty)$ **Justification:** When $x_1 < x_2$, then $f(x_1)$ $f(x_2)$
Notice: The slope of the tangent line is .

Constant interval: DNE

Intercepts: DNE **Symmetry:** y-axis origin $y=x$

Even Function Justification: **Odd Function** Justification

Continuity: Continuous Discontinuous (Removable, Non-removable)

Extrema: No absolute (global) maximum or minimum values exist.

Asymptotes: Horizontal asymptote: $y = 0$ Vertical asymptote: $x = 0$

Concavity: Concave up interval:
Notice: On the given interval, the tangent lines to the graph are the curve
 Concave down interval: DNE

Point of Inflection: DNE

End behavior: Verbally: As x approaches $-\infty$, $f(x)$ approaches 0.
 As x approaches $+\infty$, $f(x)$ approaches 0.

Symbolically: $\lim_{x \rightarrow -\infty} f(x) = \underline{\hspace{1cm}}$ $\lim_{x \rightarrow +\infty} f(x) = \underline{\hspace{1cm}}$.