Properties of Graphs of Functions (1.3)

Math Learning Target:

"I can determine the properties listed below for any function. I can prove algebraically that a function is even, odd or neither; I can verify this graphically. I can apply what I have learned in familiar and unfamiliar settings."

Parent Function — A **parent function** is the "simplest" function in a family of functions. For example, the parent function for a family of quadratic functions is $f(x) = x^2$

Transformation — A **transformation** is a geometric operation, such as a translation, reflection and compression.

Recall — Set notation versus Interval Notation

Interval(s) of Increase (informally) — The interval(s) within the domain of a function where the *y*-values get larger on the graph of the function, moving left to right.

Interval(s) of Decrease (informally) — The interval(s) within the domain of a function where the *y*-values get smaller on the graph of the function, moving left to right.

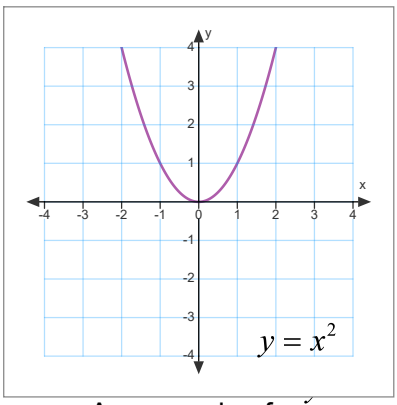
End behaviour(s) — For the function $y = f(x)$ with Domain $\{x \in R\}$, an **end behaviour** is the value that $f(x)$ approaches as x approaches ∞, and another end behaviour is the value that $f(x)$ approaches as x approaches $-\infty$.

If you forget the graph of a parent function below, simply graph it by clicking desmos

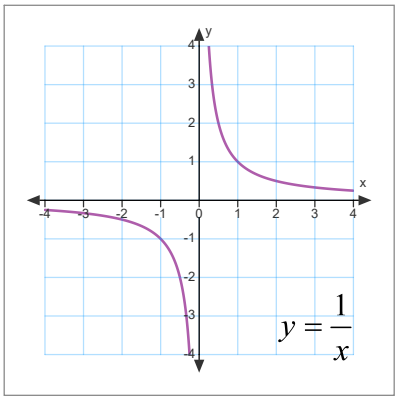
	$y = x$	$y = x^2$	$y = \frac{1}{x}$
Interval(s) of increase			
Interval(s) of decrease			
End behaviour(s)			

	$y = \lvert x \rvert$	$y = 2^x$	$y = \sqrt{x}$	$y = \sin(x)$
Interval(s) of increase				
Interval(s) of decrease				
End behaviour(s)				

Symmetry of Functions



An example of an **even function**.



An example of an **odd function**.

Even function

Odd function

Example Is $g(x) = x^2 - x$ even, odd or neither? Justify. Verify using desmos.

MathSIP! pg. 23 #3*, 4ad, 5, 6, 7, 8, 10***, 15

* Error in answer: the function can be derived from <u>any</u> $y=b^x$, for any valid "b"),

***In #10a, in the <u>instructions</u> for the question change $(-\infty, -2)$ to $(-\infty, 2]$

positive 2

square bracket

YES, you have permission to write in the textbook to make this change!