

Parent Functions - Pre-8

Topic: Functions

Date:

Objectives: SWEAT (Identify Functions by shape and their parent)

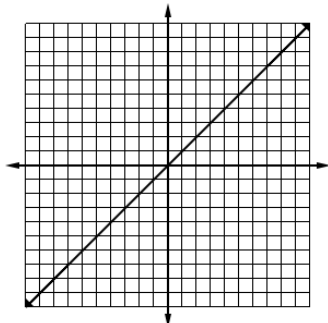
Main Ideas:

Assignment:

Function Parents

Linear or Identify

$$f(x) = x$$



x	Process	f(x)
-3		
-2		
-1		
0		
1		
2		
3		

Vertex:

Domain:

Range:

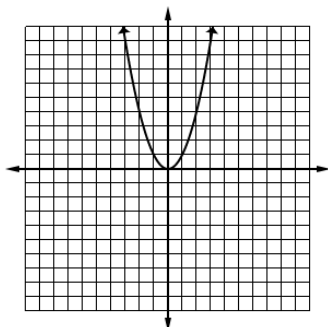
Increasing or Decreasing or Both:

Are there any intercepts?

End Behaviors:

Quadratic

$$f(x) = x^2$$



x	Process	f(x)
-3		
-2		
-1		
0		
1		
2		
3		

Vertex:

Domain:

Range:

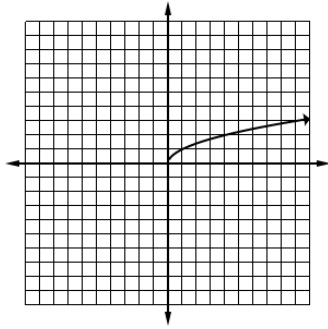
Increasing or Decreasing or Both:

Are there any intercepts?

End Behaviors:

Square Root or Radical

$$f(x) = \sqrt{x}$$

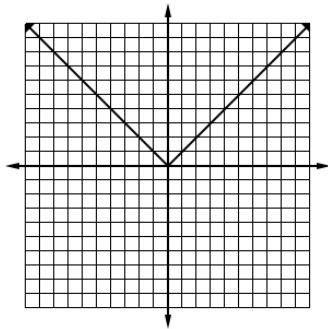


x	Process	$f(x)$
-1		
0		
1		
4		
9		
16		
25		

Vertex:	Domain:	Range:
Increasing or Decreasing or Both:	Are there any intercepts?	End Behaviors:

Absolute Value

$$f(x) = |x|$$



x	Process	$f(x)$
-3		
-2		
-1		
0		
1		
2		
3		

Vertex:	Domain:	Range:
Increasing or Decreasing or Both:	Are there any intercepts?	End Behaviors:

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Vertex Form	<p style="text-align: center;">Book: $f(x) = a \cdot f(b(x - h)) + k$ Vertex: (h, k)</p> <p style="text-align: center;">TEKS: $f(x) = a \cdot f(bx - c) + d$ (Vertex Form) Vertex: $(\frac{c}{b}, d)$</p> <p style="text-align: center;"><u>c or h – Horizontal Shift or Translation</u> <u>d or k – Vertical Shift or Translation</u></p> <p>c (or h) units right when c (or h) is positive c (or h) units left when c (or h) is negative</p> <p>d (or k) units up when d (or k) is positive d (or k) units down when d (or k) is negative</p> <p>Domain is either $\{x x \geq \frac{c}{b} \text{ or } h\}$ or $\{x x \leq \frac{c}{b} \text{ or } h\}$ or all real #'s Depending on b-value and parent</p> <p style="text-align: center;"><u>a – Vertical Transformation</u> <u>b – Horizontal Transformation</u></p> <p>If $a < 0$, the graph is reflected over x – axis If $a > 1$, the graph is vertically stretched If $0 < a < 1$, the graph is vertically compressed</p> <p>If $a > 0$, range is $\{f(x) f(x) \geq k\}$ or all real #'s If $a < 0$, range is $\{f(x) f(x) \leq k\}$ or all real #'s Depending on parent</p> <p>If $b < 0$, the graph is reflected over y – axis If $b > 1$, the graph is horizontally compressed If $0 < b < 1$, the graph is horizontally stretched</p>
Example	<p style="text-align: center;">$f(x) = -5 x + 6 - 2$</p> <p>What is the main operation that is happening to x? (<u>Hint</u>: what is the parent?)</p> <p>What is the Vertex?</p> <p>Let's identify all the parts What does each one mean?</p> <p>$a =$</p> <p>$b =$</p> <p>$c =$</p> <p>$d =$</p>

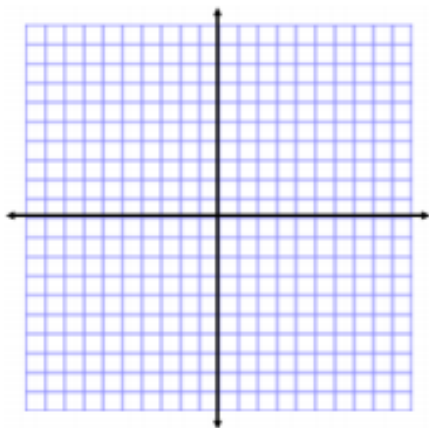
Here we GO!

- 1) Give the name of the parent function that this function belongs to.
- 2) Identify the transformations that have been done unto him/her.
- 3) Make a sketch of the function.

$$g(x) = x^2 - 1$$

Parent: _____

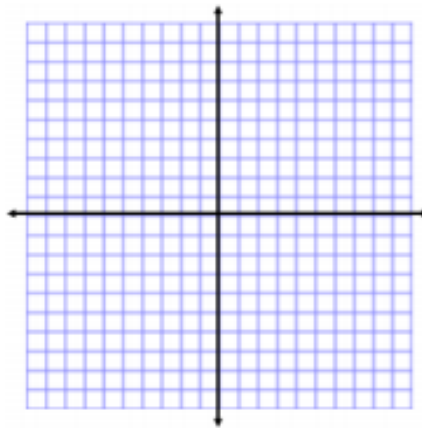
Transformations: _____



$$f(x) = 2|x - 1|$$

Parent: _____

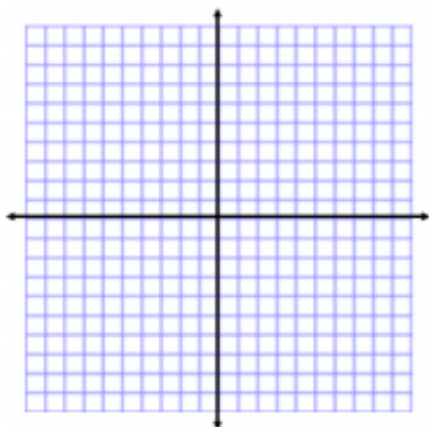
Transformations: _____



$$f(x) = -2(x + 1)^2 + 3$$

Parent: _____

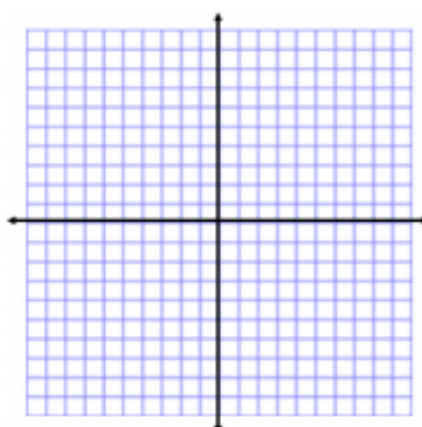
Transformations: _____



$$h(x) = -\sqrt{x - 5} - 2$$

Parent: _____

Transformations: _____



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Creating from Description

Parent: Quadratic

Transformations: vertically stretch by a factor of 2, vertically reflected about the x -axis, horizontal shift left 3, and vertical shift down 5

Parent: Radical or Square Root

Transformations: vertically reflected about the x -axis, horizontal shift right 8

Parent: Absolute Value

Transformations: vertically compressed by a factor of $\frac{2}{3}$, horizontal shift left 5, and vertical shift up 7

Parent: Quadratic

Transformations: vertically stretch by a factor of 2, vertically reflected, horizontal shift left 3, and vertical shift down 5