**Unit 6: Transformations**

**Lesson 1: Shifts**

Objectives:

* I can identify parent functions
* I can identify different types of transformations (shifts) from parent functions
* I can sketch functions and their transformation (shifts)

Agenda:

* Use your skills
* Use all your skills
* Challenge your skills

Vocabulary:

* Function, parent function, transformed function, vertical shift, horizontal shift.

Focus Questions:

1. How do we describe the difference between the graphs of any function and its parent function?

Online support:

<https://www.youtube.com/watch?v=nzwdRWmPH9o>

<https://www.youtube.com/watch?v=IFT2uznB7fM>

<https://www.youtube.com/watch?v=7S5HF38DnUY>

Online Practice:

<https://www.purplemath.com/modules/fcntranq.htm>

<https://www.ixl.com/math/algebra-2/function-transformation-rules>

Homework:

 Finish the portfolio for Unit 5. Unit test is on Wednesday/Thursday (1- 8 and 1- 9-20)



A

Parent Function $f\left(x\right)=x^{2}$



$$t\left(x\right)=x^{2}+3$$

B



C

$$w\left(x\right)=x^{2}-4$$



D

$$z\left(x\right)=(x+3)^{2}$$



E

$$h\left(x\right)=(x-1)^{2}$$

Match the correct graph with the correct function

Do Now: one graphing question from the portfolio.

**Lesson 6-1: Class Notes:**



Horizontal

Horizontal

1. Name the parent function first then explain how each graph has changed from its parent function. You might sketch if you choose.
2. $f\left(x\right)=\left|x\right|-3$ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. $f\left(x\right)=x^{2}+5$ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
4. $f\left(x\right)=\sqrt{x-6}$ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
5. $f\left(x\right)=\sqrt[3]{x+2}$ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
6. $f\left(x\right)=(x-1)^{3}+4$ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

2)Give the name of the parent function, describe the transformation represented, and state the domain and range.

1. $g\left(x\right)=x^{2}-1$ Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Sketch here: Transformation: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 Domain: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Range: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. $f\left(x\right)=\left|x-1\right|-6$ Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 Transformation: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 Domain: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Range : \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. $f\left(x\right)=\sqrt{x-4}$ Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 Transformation: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 Domain: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Range : \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Practice:**

**Sketch the following transformations.** $f\left(x\right)=x^{2}$

**Use the Function Transformation word bank above to describe the transformation that changed the parent function f(x) to the transformed functions**

|  |  |  |
| --- | --- | --- |
| $$g\left(x\right)=f\left(x\right)+5$$Transformation: | $$g\left(x\right)=f\left(x\right)-1$$ Transformation: | $$g\left(x\right)=f\left(x-2\right)$$Transformation: |
| $$g\left(x\right)=f\left(x+6\right)$$ Transformation: | $$g\left(x\right)=f\left(x+3\right)-2$$ Transformation: | $$g\left(x\right)=f\left(x-4\right)+1$$ Transformation: |

**Name: \_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Homework 6-1: Due after the Unit test.**

**Sketch the following transformations from f(x) without a calculator. Use the Function Transformation word bank above to describe the transformation that changed the parent function f(x) to the transformed functions**

|  |  |  |
| --- | --- | --- |
| Parent Function $f\left(x\right)=\left|x\right|$ | $$t\left(x\right)=\left|x\right|+2$$ Transformation: | $$w\left(x\right)=\left|x\right|-4$$Transformation: |
| $$z\left(x\right)=\left|x-3\right|$$ Transformation: | $$h\left(x\right)=\left|x+5\right|$$ Transformation: | $$h\left(x\right)=\left|x+3\right|-4$$ Transformation: |

**Sketch the following transformations from f(x) without a calculator. Use the Function Transformation word bank above to describe the transformation that changed the parent function f(x) to the transformed functions**

|  |  |  |
| --- | --- | --- |
| Parent Function $f\left(x\right)=\sqrt{x}$ | $$t\left(x\right)=\sqrt{x}+3$$ Transformation: | $$w\left(x\right)=\sqrt{x-5}$$Transformation: |