## Dilations, Reflections, Translations, oh my!

## Dilations, Reflections, Translations, oh my!

Example: Sketch the graph of

$$
y=-2 x^{3}+1
$$

## Dilations, Reflections, Translations, oh my!

Example: Sketch the graph of

$$
y=-2 x^{3}+1
$$

Here, we want to start with the basic graph: $f(x)=x^{3}$


## Dilations, Reflections, Translations, oh my!

Example: Sketch the graph of

$$
y=-2 x^{3}+1
$$

Here, we want to start with the basic graph: $f(x)=x^{3}$
The first thing that happens to $x^{3}$ is that we multiply by -2


## Dilations, Reflections, Translations, oh my!

Example: Sketch the graph of

$$
y=-2 x^{3}+1
$$

Here, we want to start with the basic graph: $f(x)=x^{3}$ The first thing that happens to $x^{3}$ is that we multiply by -2
Multiplying $f(x)$ by 2 stretches the graph vertically by 2


## Dilations, Reflections, Translations, oh my!

Example: Sketch the graph of

$$
y=-2 x^{3}+1
$$

Here, we want to start with the basic graph: $f(x)=x^{3}$ The first thing that happens to $x^{3}$ is that we multiply by -2
Multiplying $f(x)$ by 2 stretches the graph vertically by 2

- Multiplying $f(x)$ by -1 reflects the graph across the $x$-axis



## Dilations, Reflections, Translations, oh my!

Example: Sketch the graph of

$$
y=-2 x^{3}+1=-1 \cdot 2 x^{3}+1
$$

Here, we want to start with the basic graph: $f(x)=x^{3}$
The first thing that happens to $x^{3}$ is that we multiply by -2
Multiplying $f(x)$ by 2 stretches the graph vertically by 2
Mutioplying $f(x)$ by -1 reflects the graph across the $x$-axis
Since $-2=-1 \cdot 2$


## Dilations, Reflections, Translations, oh my!

Example: Sketch the graph of

$$
y=-2 x^{3}+1=-1 \cdot 2 x^{3}+1
$$

Here, we want to start with the basic graph: $f(x)=x^{3}$
The first thing that happens to $x^{3}$ is that we multiply by -2
Multiplying $f(x)$ by 2 stretches the graph vertically by 2
Mutioplying $f(x)$ by -1 reflects the graph across the $x$-axis
Since $-2=-1 \cdot 2$ we reflect


## Dilations, Reflections, Translations, oh my!

Example: Sketch the graph of

$$
y=-2 x^{3}+1=-1 \cdot 2 x^{3}+1
$$

Here, we want to start with the basic graph: $f(x)=x^{3}$
The first thing that happens to $x^{3}$ is that we multiply by -2
Multiplying $f(x)$ by 2 stretches the graph vertically by 2
Mutioplying $f(x)$ by -1 reflects the graph across the $x$-axis
Since $-2=-1 \cdot 2$ we reflect and stretch


## Dilations, Reflections, Translations, oh my!

Example: Sketch the graph of

$$
y=-2 x^{3}+1=-1 \cdot 2 x^{3}+1
$$

Here, we want to start with the basic graph: $f(x)=x^{3}$
The first thing that happens to $x^{3}$ is that we multiply by -2
Multiplying $f(x)$ by 2 stretches the graph vertically by 2
Multiplying $f(x)$ by -1 reflects the graph across the $x$-axis
Since $-2=-1 \cdot 2$ we reflect and stretch
Adding 1 will vertically shift $-2 x^{3}$ by 1


## Dilations, Reflections, Translations, oh my!

Example: Sketch the graph of

$$
y=-2 x^{3}+1=-1 \cdot 2 x^{3}+1
$$

Here, we want to start with the basic graph: $f(x)=x^{3}$
The first thing that happens to $x^{3}$ is that we multiply by -2
Multiplying $f(x)$ by 2 stretches the graph vertically by 2
Multiplying $f(x)$ by -1 reflects the graph across the $x$-axis
Since $-2=-1 \cdot 2$ we reflect and stretch
Adding 1 will vertically shift $-2 x^{3}$ by 1


