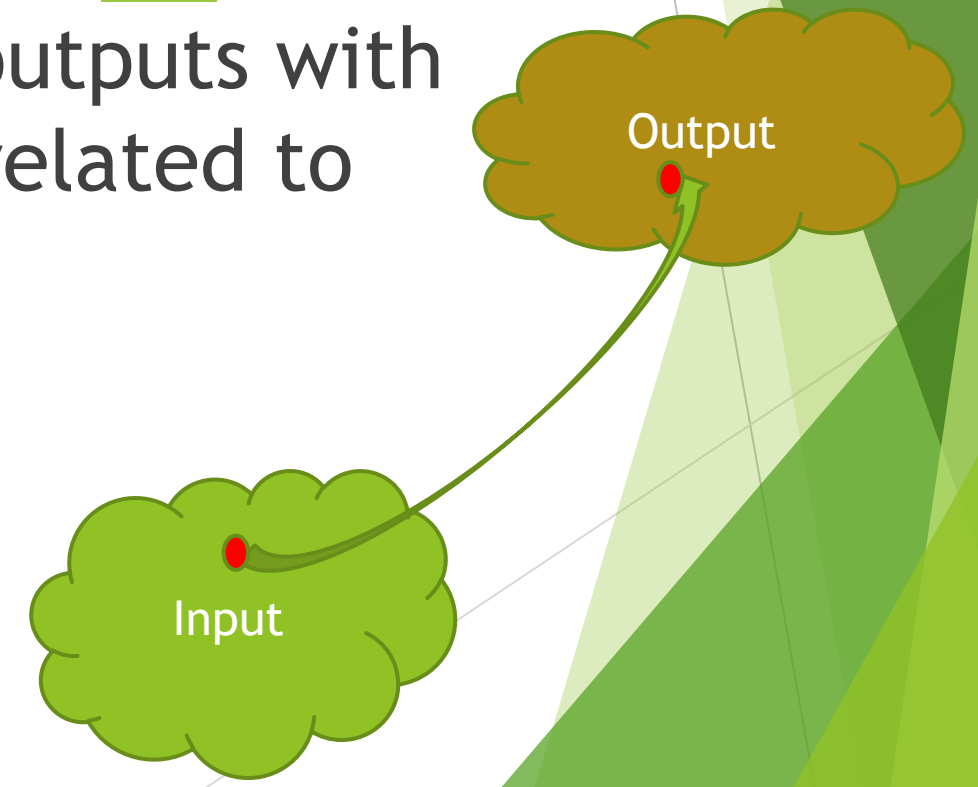
FUNCTIONS!!! YOU REALLY NEED IT

What is a function

A **function** is a relation between a set of inputs and a set of permissible outputs with the property that each input is related to exactly one output



What is a SET

A set is a **well-defined** collection of objects.

It is possible to determine if something belongs to the collection or not, without prejudice.

What is a SET

Is the collection of all US presidents a set?

YES

How many elements are in this set?

44

What is a SET

Is the collection of the most beautiful Hollywood actresses a set? NO

What is a RELATION

What is a function

The rule that defines which laptop belongs to whom is the function

f (student)=laptop

The students in the group are input

The laptops are output

What is a function

What if one of you forgot to bring a laptop and share it with a friend?

Is this still a function?

YES

What is a function

What if one of you brought 2 laptops and is using both ?

Is this still a function?

NOT

What is a function

Which of the following is a function, if X is input and Y is output

$Y=10X+5$ YES For each X the is only one Y

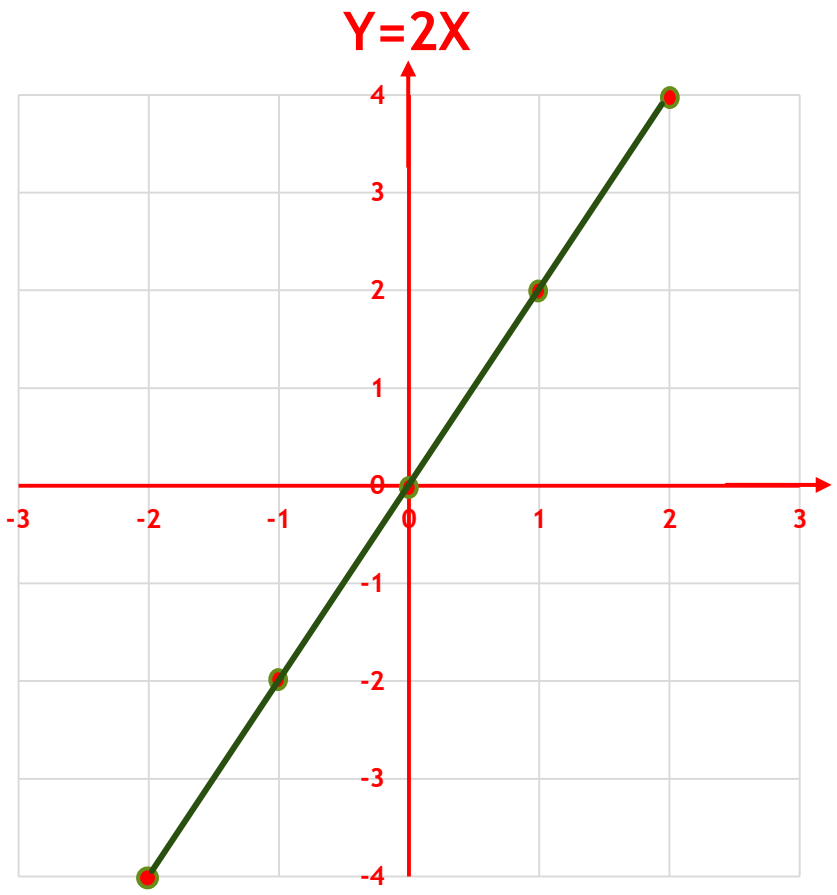
$Y^2=1-X^2$ NO X=0 Y=1 or Y=-1

What is a function

The Fundamental Graphing Principle for Functions.

The graph of a function f is the set of points which satisfy the equation y = f(x). That is, the point (x; y) is on the graph of f if and only if y = f(x).

What is a function



Y=2X

X=-2 Y=-4
X=-1 Y=-2
X=0 Y=0
X=1 Y=2
X=2 Y=4

TRANSFORMATIONS

Now let's play with graphs

Suppose you have a graph of f(x) that describes it. Can you find the following functions

$g(x)=f(x)+a$

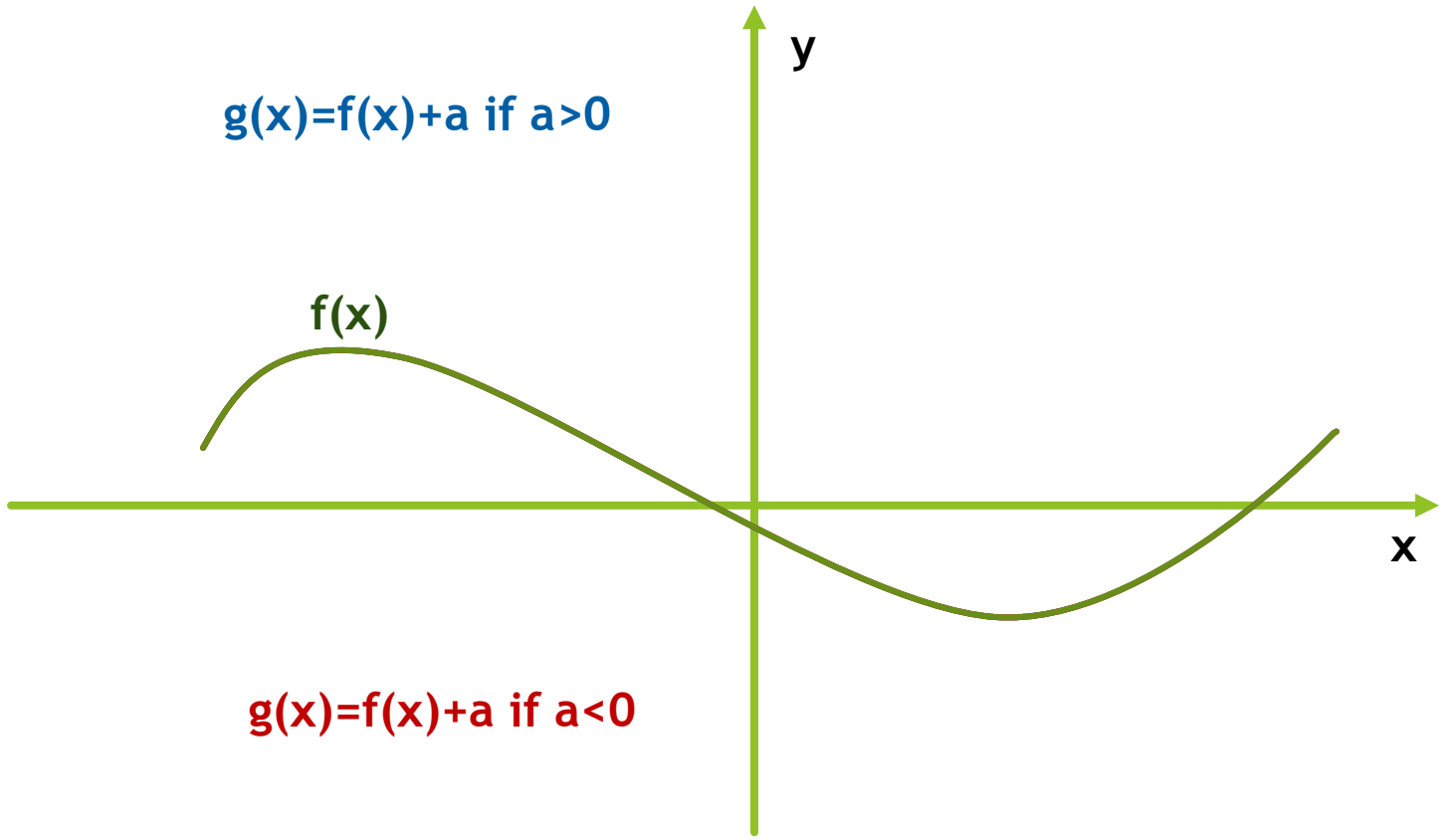
$g(x)=f(x+a)$

$g(x)=af(x)$

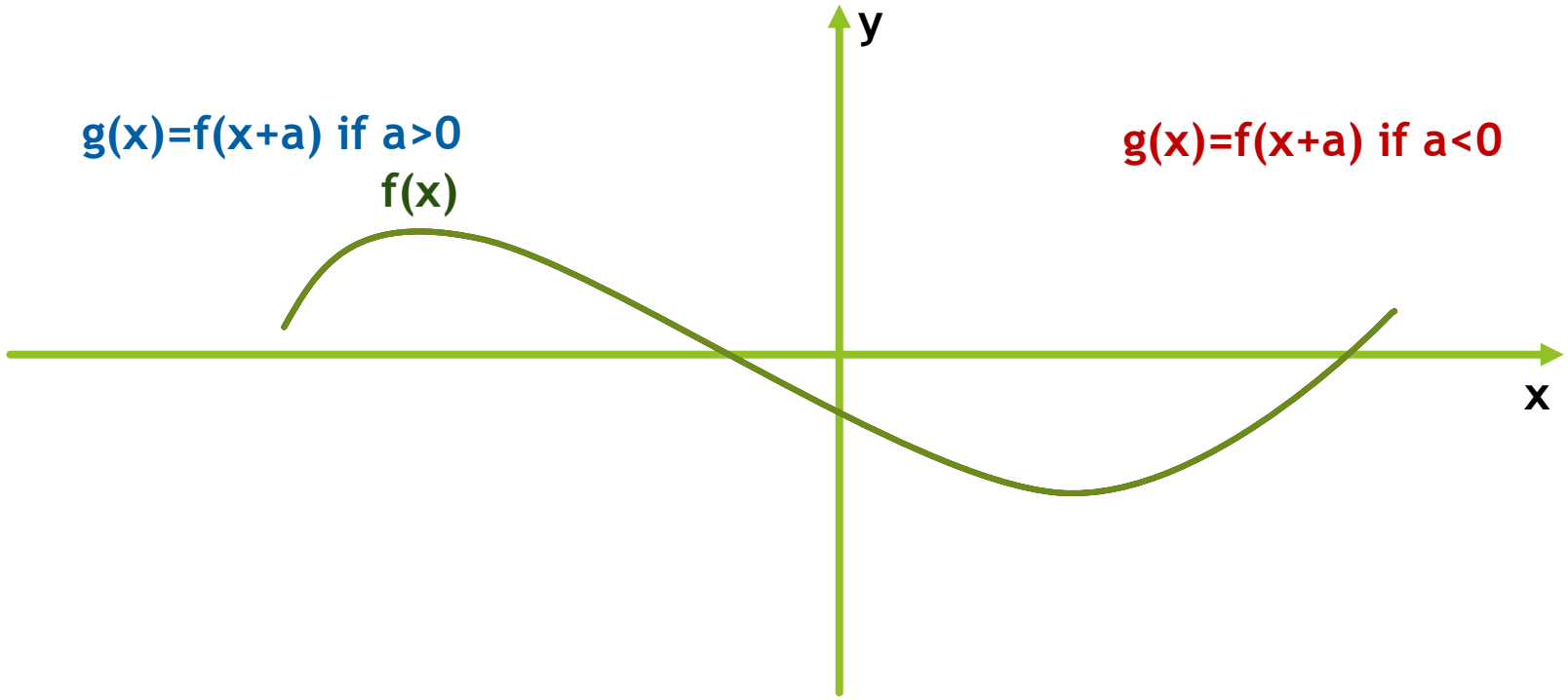
$g(x)=f(ax)$

YES

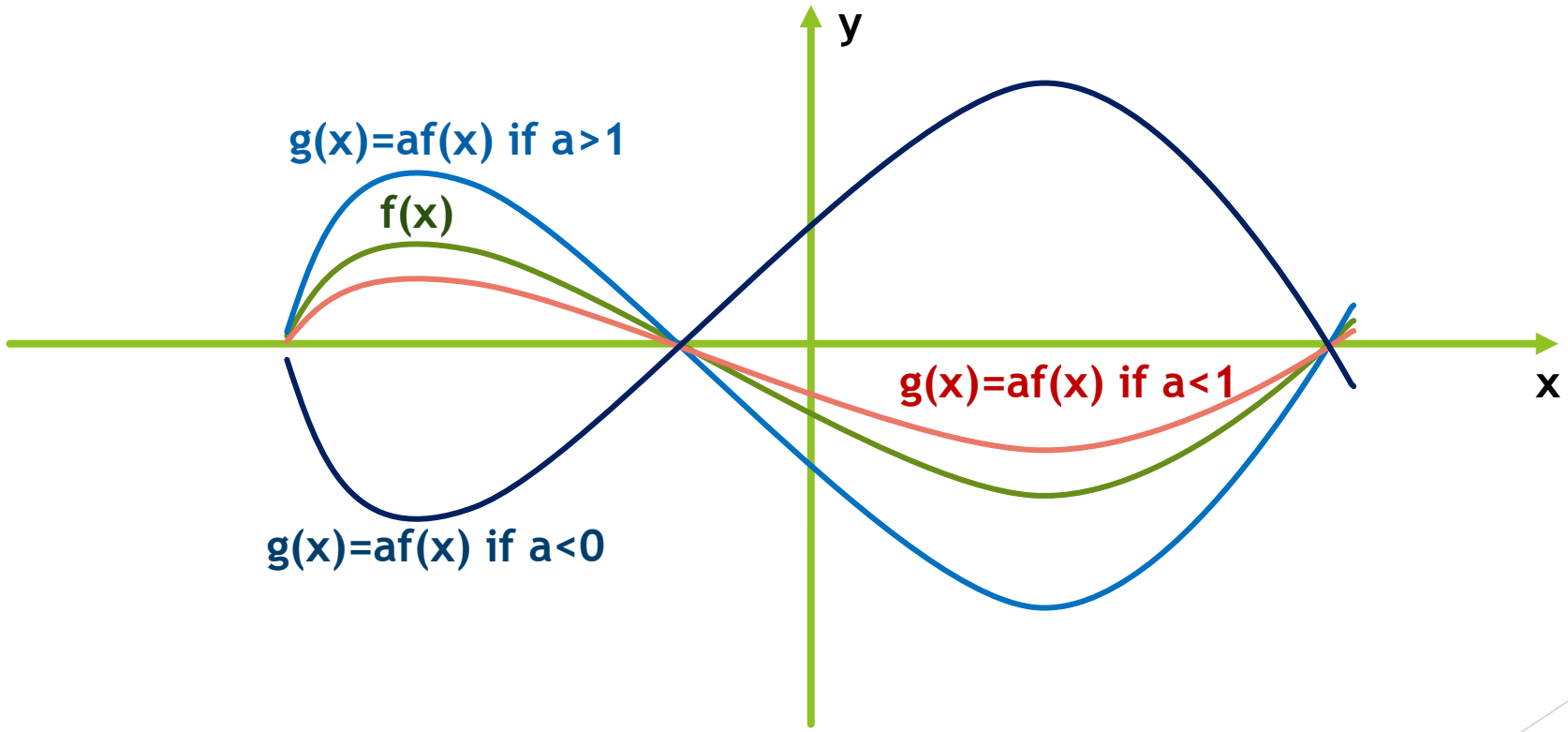
Transformations g(x)=f(x)+a



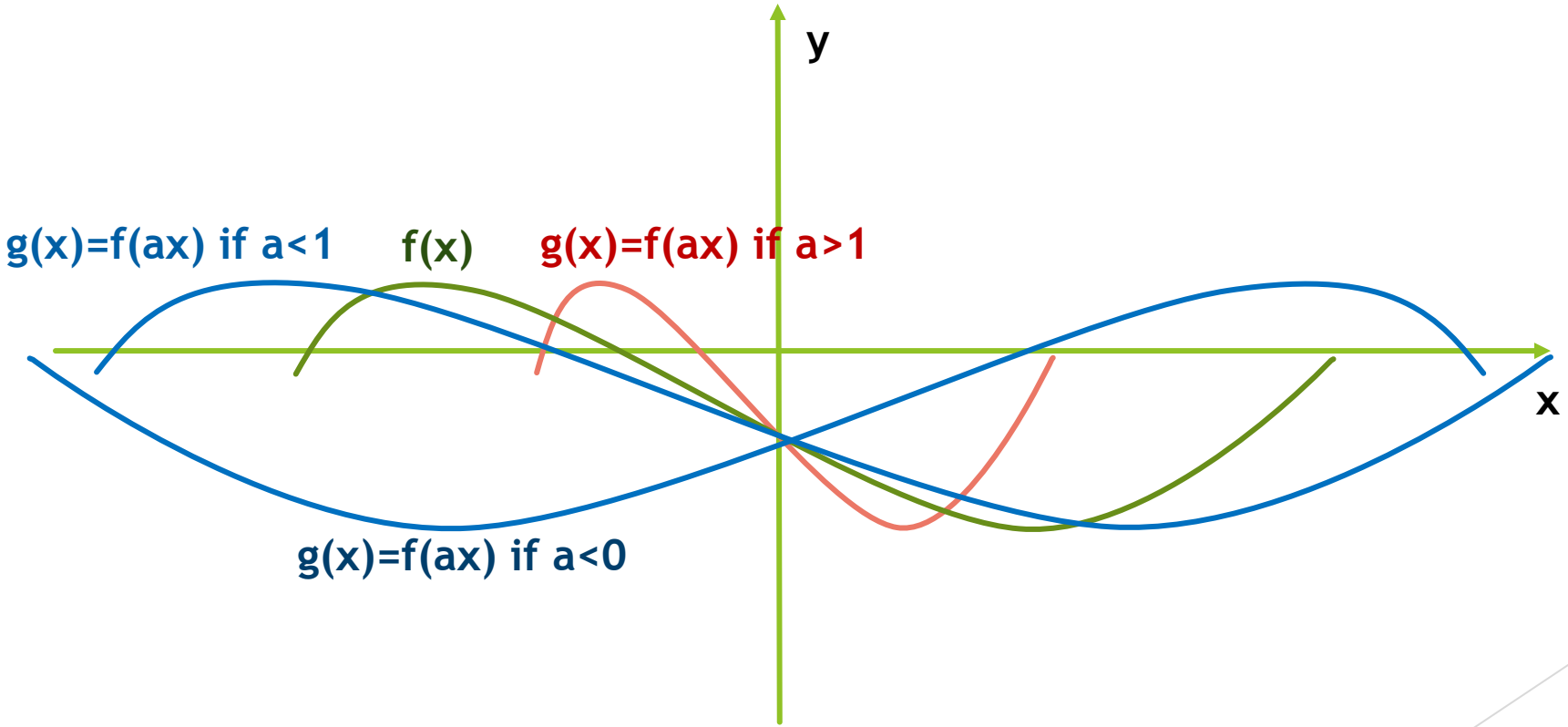
Transformations g(x)=f(x+a)



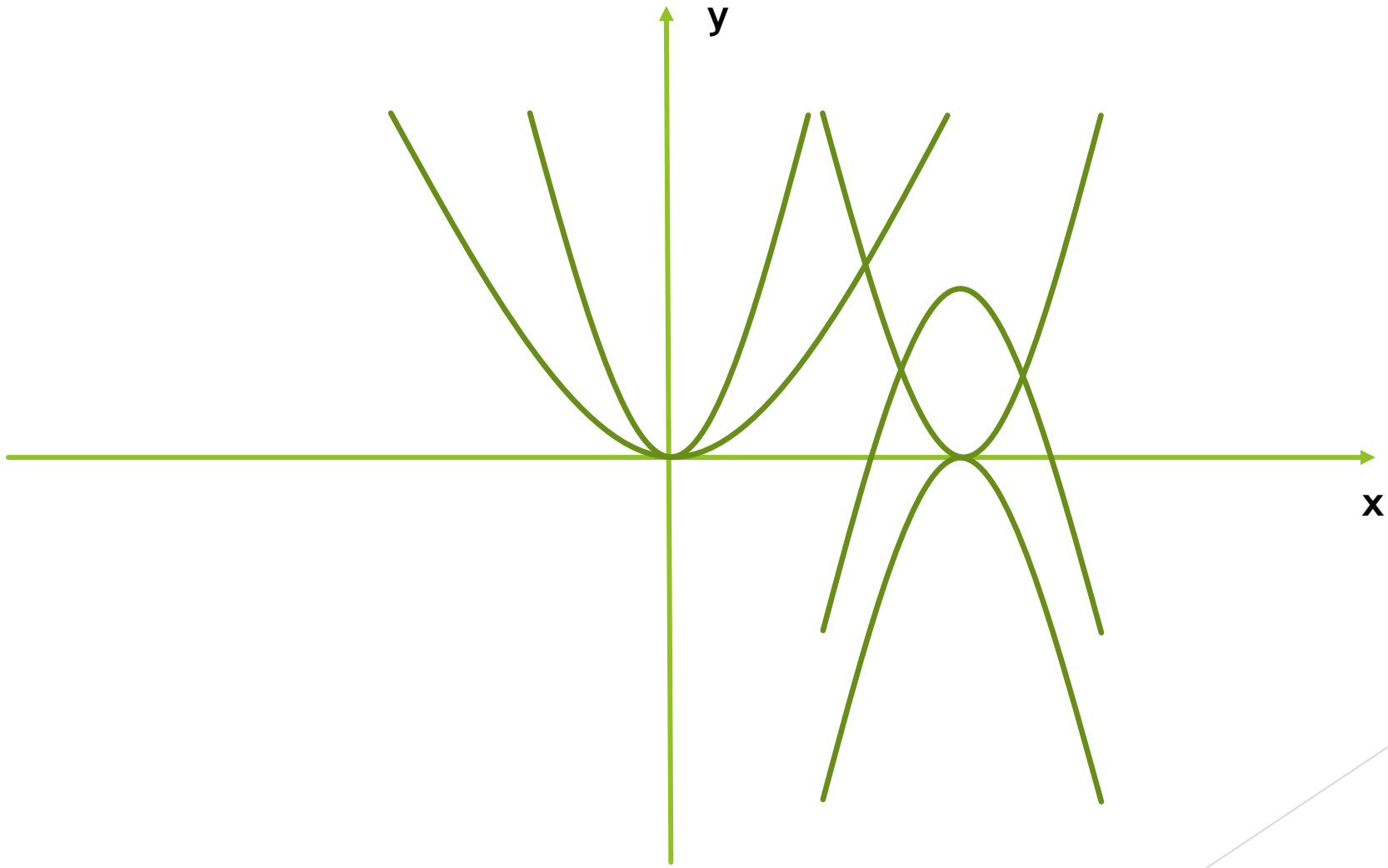
Transformations g(x)=af(x)



Transformations g(x)=f(ax)



$f(x)=(2x-7)^2+4$



THANK YOU