GOOD MORNING!
MY NAME IS

WARM UP

Talk to a partner and explain to each other:

slope = Anstieg

1. What is a tangent?
2. What does the slope of the tangent describe in the context of functions?
3. How do you calculate the slope of the tangent of a function in one point?

VOCABULARY TIME

Nullstelle

a zero is the solution to the equation f(x) = 0

Minimum

extremum

zero

Maximum

minimum

umbrella term for local or global maxima and minima

smallest value taken by a function

maximum

Extremum

largest value taken by a function

Match the words with the corresponding definitions and translations.

word				
definition				
translation				

THE HOT-AIR BALLOON

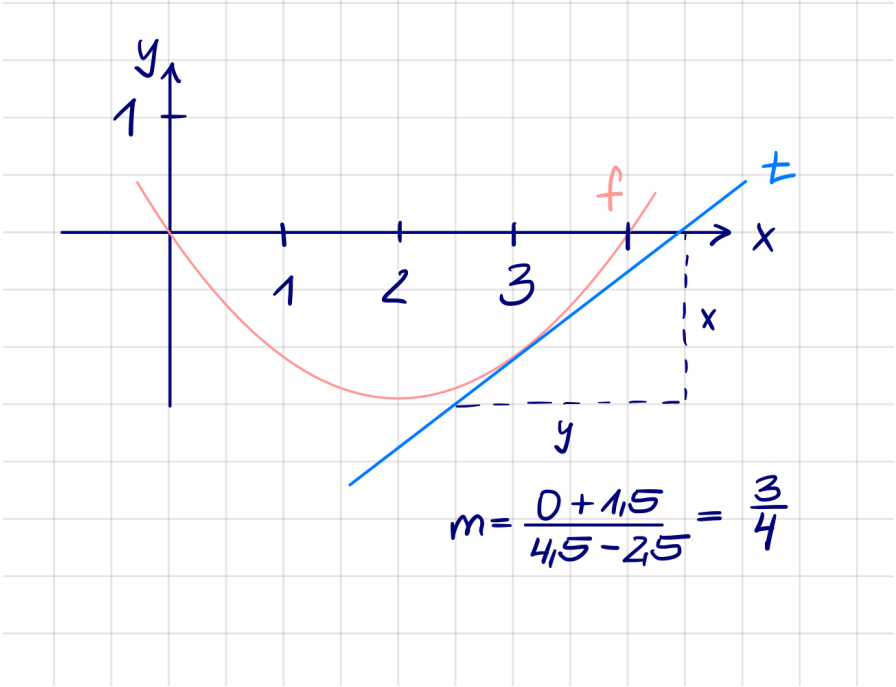
On your worksheet you can see the graph of a function f that depicts a part of the flight of a hot-air balloon.

1. Draw the tangents to the graph at several points (at least 7) and approximately determine their slopes.
2. Fill in the table with the x-values and the corresponding slopes of the tangents.
3. Transfer the data into a new coordinate system. This is the graph of the derivative f′ of f.
4. What can you say about the connection between f and f′ and what does f′ tell you about the flight of the hot-air balloon?

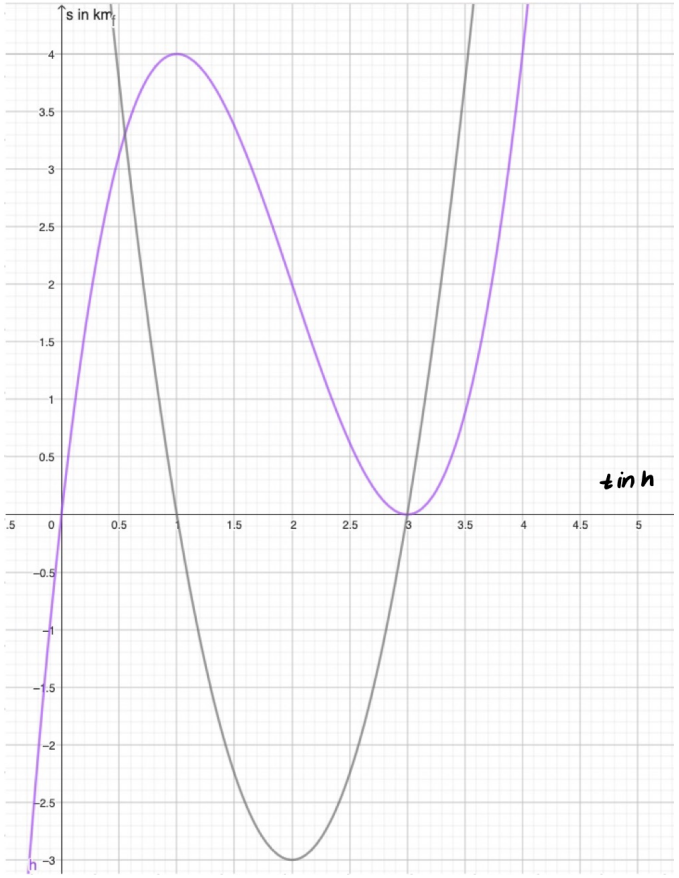
f′ = f prime

REMINDER - DETERMINING SLOPES OF TANGENTS

1. Draw a tangent to the graph at a point of your choice.
2. Draw a slope triangle to the tangent.
3. Determine the slope of the tangent by using the slope triangle or the formula $m = \frac{y_2 - y_1}{x_2 - x_1}$.



THE HOT-AIR BALLOON - SOLUTION



x	slope
0	9
0,5	3,7
1	0
1,5	-2,25
2	-3
3	0
3,5	3,7

FUNCTIONS - EXTREMA

With the help of the **derivative f'** one can see where the **original function f has minima and maxima**, as at these points the **zeros of f' are located.**

TIME FOR PRACTICE!

Each of you solves the **mandatory task** on the worksheet “Minima and maxima of functions“.

Done?

Then you can work on the **additional task**.

M - mandatory task
A - additional task

Please make sure to check your solutions!

THANK YOU FOR YOUR ATTENTION!