



You have to talk for ten minutes about this subject. Which mathematical notion(s) do you recognize?  
The questions may help you, but answering all of them is not compulsory:  
you can simply explain a way to solve an exercise, even if you can't find the solution

## Ski jump



The ski jump is divided into four separate sections:

- 1) In-run
- 2) Take off (jump) at point T
- 3) Flight
- 4) Landing at point L

### Introduction :

A, B and L are collinear points.

$A(0, 50)$  ;  $B(40, 24)$ .

Find an equation of the line that connects the point A to the point B.

This line is called the landing slope.

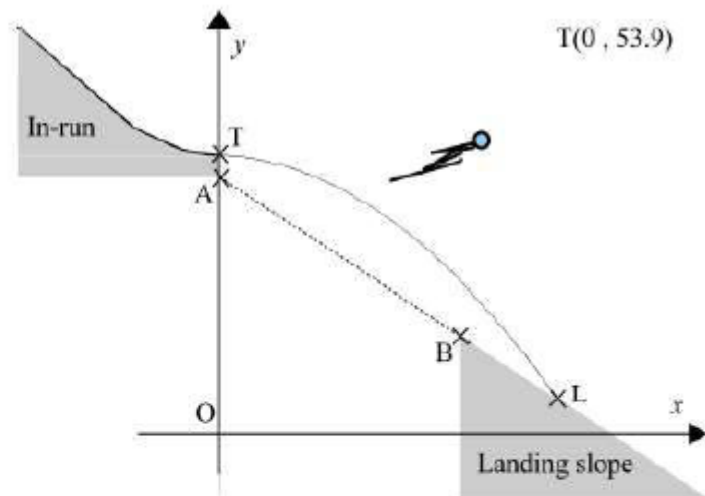
### Questions :

We admit that the jump has a parabolic shape.

Its equation is :

$$y = -0.00825x^2 - 0.12x + 53.9$$

where  $x$  and  $y$  are measured in metres.



- 1) Find an equation of the tangent to the curve that goes through the point  $T(0, 53.9)$ .
- 2) Calculate the coordinates of the point L where the ski jumper lands. (Round the coordinates to one decimal place).
- 3) Knowing that  $T(0, 53.9)$ , calculate the length of the jump (distance between points T and L) and round it to one decimal place.