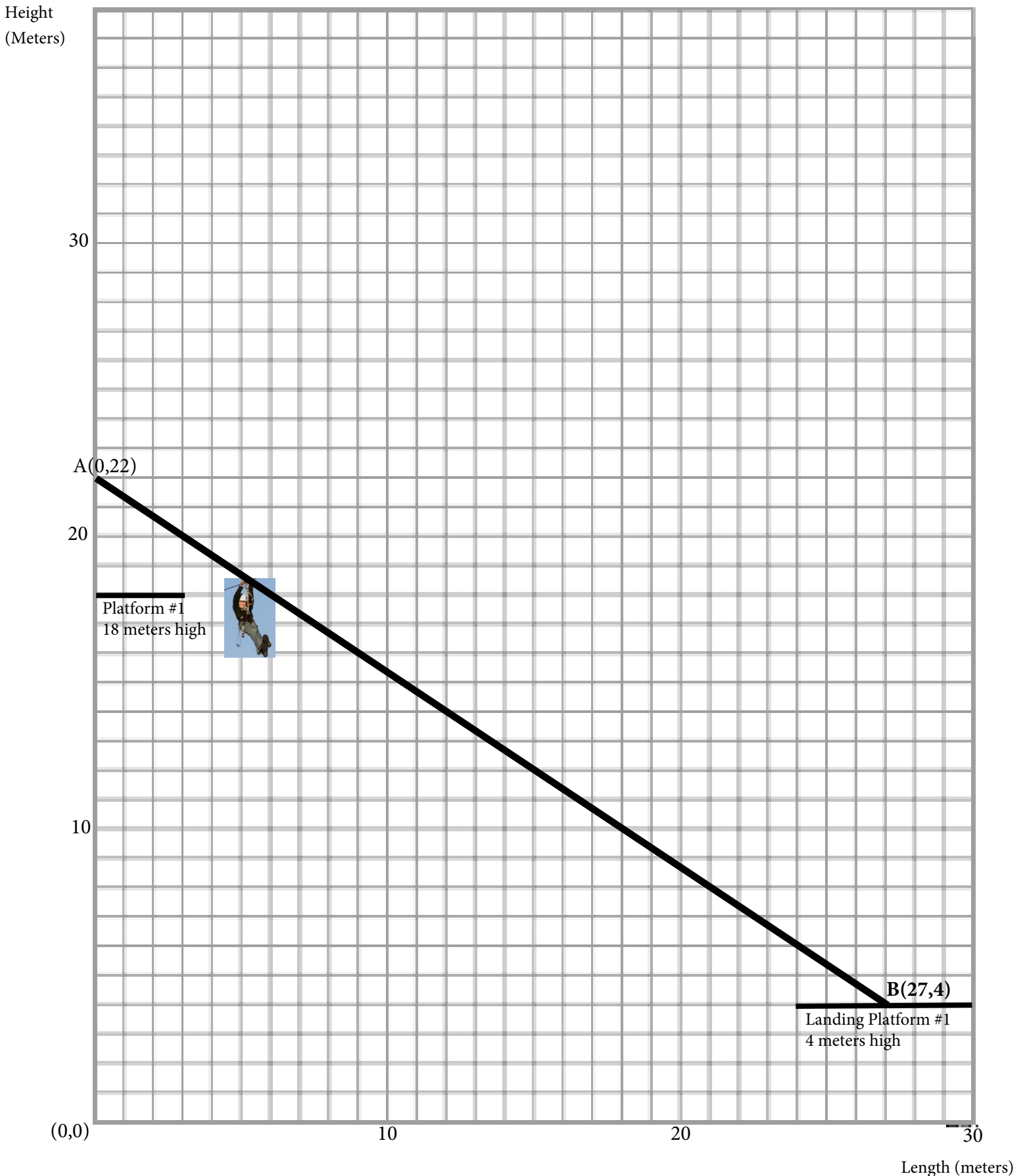


Zip Line Activity

The Indoor Zip Line Company uses a room that is 30 meters long and 38 meters high to set up their zip line. The zip line industry has many safety regulations. Regulation #1 is that the platform from which you launch from must be a minimum of 3 meters long. Regulation #2 is that the platform that you land on must be a minimum of 6 meters long. Regulation #3 is that the zip line must be 2 meters above the edge of both the launching and landing platforms. There are other regulations that deal with the steepness, distance, and the sag (slack) of the zip line as well. The Indoor Zip Line Company starts by building one zip line with the maximum steepness allowed. Here is a graph of their first zip line.



Zip Line Activity

1. The Indoor Zip Line Company built their zip line to be the steepest allowed by regulations. Complete the following safety regulation about steepness.

Regulation #4 is ...

2. a) What is the distance from point A to point B?

b) Regulation #5 deals with the distance of the zip line ride and how much sag there must be in the cable. According to the regulation, the sag in the cable must have at least 5% of the distance from point A to point B. What does the minimum length of the cable have to be to meet this regulation?

3. a) Assuming there is no sag in the cable, write the equation of the zip line in slope intercept form.

b) Assuming there is no sag in the cable, write the equation of the zip line in standard form.

4. a) The Indoor Zip Line Company has been getting request to build a second zip line that is more exciting, but safety regulations won't allow them to build one that is steeper. So instead of going steeper they decide to build one that is higher off the ground. Their second 3 meter launching platform will be 29 meters off the ground. If the distance and the steepness stay the same as the first zip line, and they follow all of the regulations, how high must the second 6 meter landing platform be off the ground?

b) Assuming there is no sag in the cable, write the equation of the second zip line in slope-intercept form.

5. a) To maximize their space the Indoor Zip Line Company decides to build a third zip line using the second landing platform as their third launching platform. This is still within regulation since the minimum launching platform is 3 meters long and this platform is 6 meters long. The third zip line will have the same steepness and distance as the first two zip lines. Knowing that the zip line must be 2 meters above the edge of the platforms and the third landing platform must be 6 meters long, what is the equation of the third zip line in slope-intercept form assuming no sag?

b) What the domain and range of the 3rd zip line?

6. At what height do the first and third zip lines intercept?