

OPTIMIZATION

December 3rd, 2018

Distance

Find the point on the parabola $y^2 = 2x$ that is the closest to the point $(1, 4)$.

For next lectures

For Wednesday (Dec 5), watch the videos:

- Concavity: 6.11, 6.12
- Asymptotes: 6.13, 6.14, 6.15, 6.16

For Thursday (Dec 6), watch the videos:

- Curve sketching: \emptyset

The classic farmer problem

A farmer has $300m$ of fencing and wants to fence off a rectangular field and add an extra fence that divides the rectangular area in two equal parts down the middle. What is the largest area that the field can have?

Fire (1)

You hear a scream. You turn around and you see that Alfonso is on fire. Literally.

Luckily, you are next to a river.

Alfonso is 10 meters away from the river and you are 5 meters away from the point P on the river closest to Alfonso.

You are carrying an empty bucket. You can run twice as fast with an empty bucket as you can run with a full bucket.

How far from the point P should you fill your bucket in order to get to Alfonso with a bucket full of water as fast as possible?

Fire (2)

You hear a scream. You turn around and you see that Alfonso is on fire. Literally.

Luckily, you are next to a river.

Alfonso is 10 meters away from the river and you are **8** meters away from the point P on the river closest to Alfonso.

You are carrying an empty bucket. You can run twice as fast with an empty bucket as you can run with a full bucket.

How far from the point P should you fill your bucket in order to get to Alfonso with a bucket full of water as fast as possible?