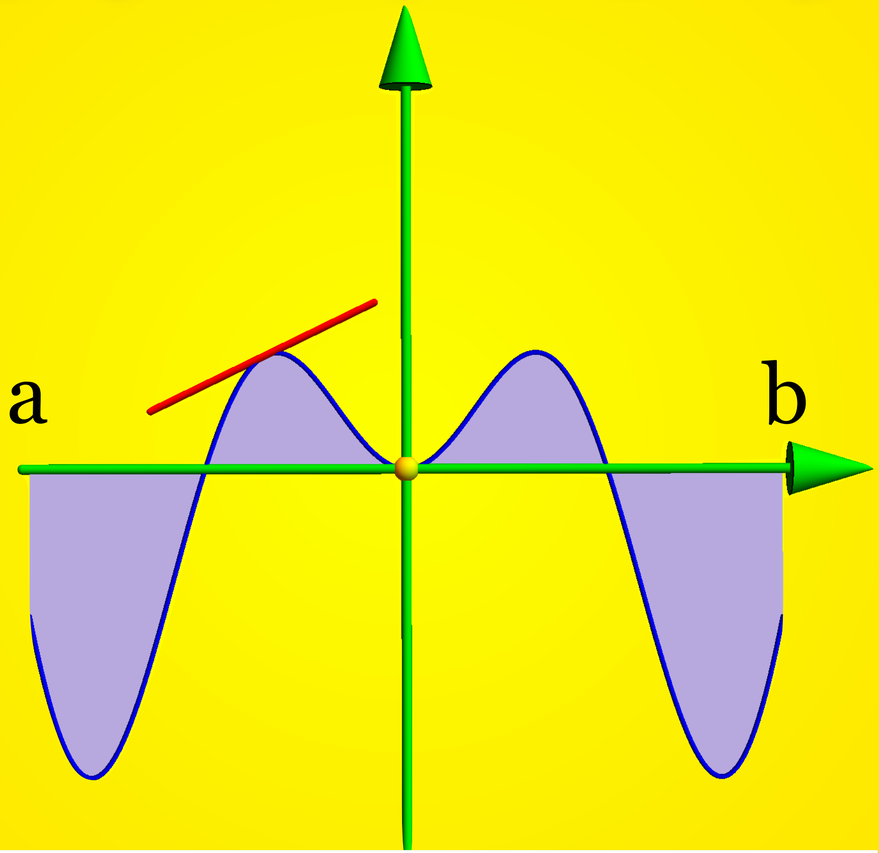
1 What is Calculus?

change

differences

derivative

slope



$$\int_a^b f'(x)dx = f(b) - f(a)$$

predict

sums

integral

area

Hello!

I'm Oliver, was designed
in a secret science
lab in Switzerland

You can call
me Oliver

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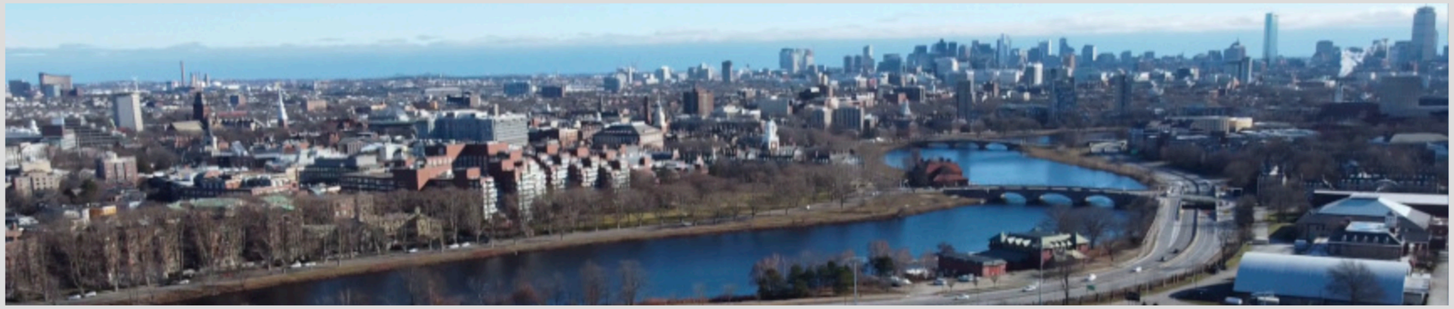
WEBSITE

Math 1a Spring 2021

1a Introduction to Calculus

Home | Syllabus | Q & A | Exam | Data | Exhibit | Quizz



Class location:

MWF at 10:30 AM in ZOOM link on Canvas
MQC: Sun/Tue/Thu 8:30-10:30 ZOOM

Course Staff:

- Oliver Knill: knill@math
- Michaela Donato, michaeladonato@college

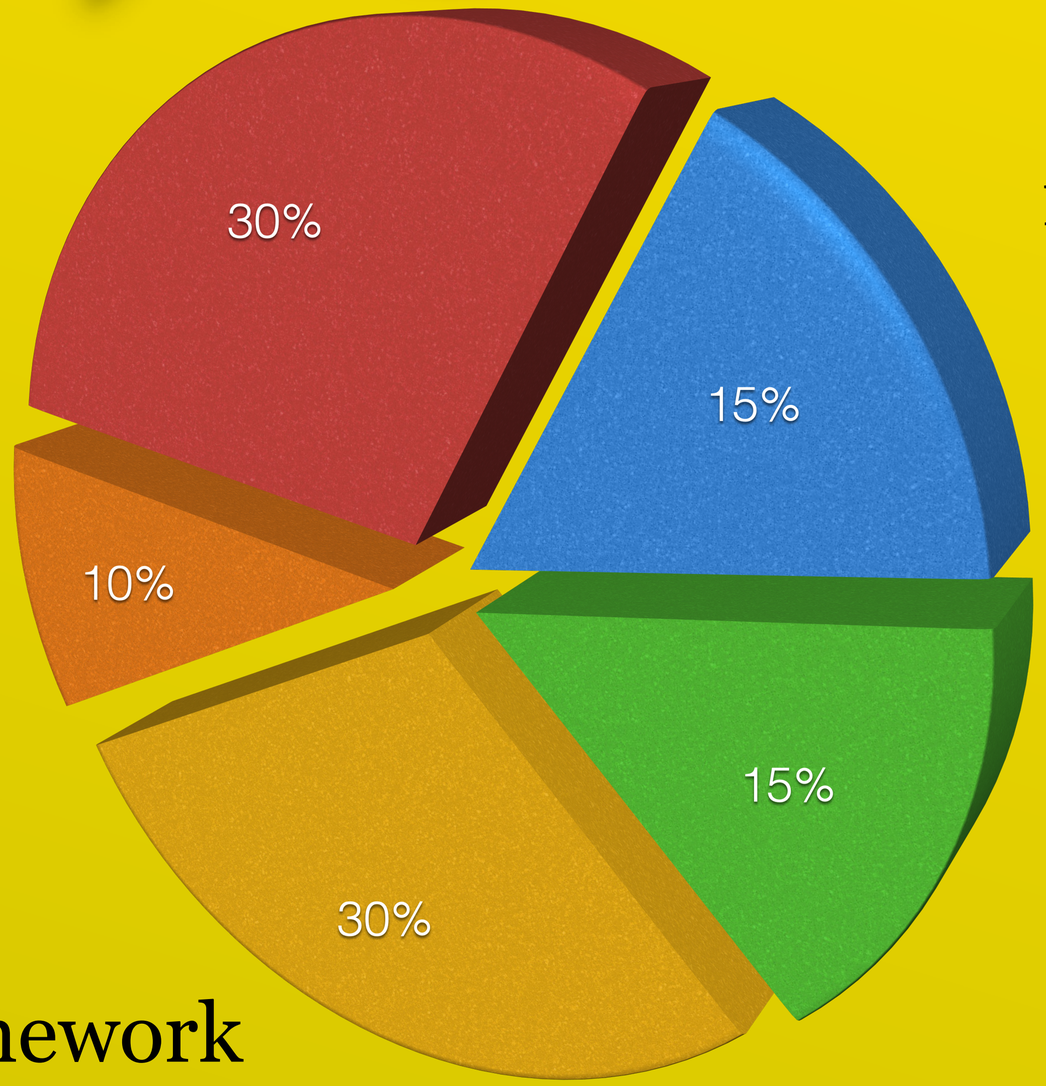
Math 1a Announcements

- Welcome to Math 1a, Spring 2021. The spring course is traditionally small one section course.
- Classes will meet 10:30 M,W,F. If you are interested in this course you should be able to make this time. This is the only mandatory time. We will announce office hours and MQC hours on this website. The ``lab" part deals with QRD data projects done in groups spread throughout the semester.
- If you are still unsure about which math course is right for you, please sign up for advising here.
- This website is still in the process of being built up. Please contact me (Oliver) knill@math.harvard.edu if you have questions. To get an idea, we have posted the first lecture homework already. Every lecture has a 5 problem HW part.

Canvas for submission.

Public website of Oliver
http://www.math.harvard.edu/~knill
for content and announcements.

GRADES



final exam

midterm 1

data projects

midterm 2

homework

TECHNOLOGY

small group work

Jamboards

Zoom Class

class (mandatory)
office hours, MQC

usually on youtube

Videos

Email

preferred way to contact

i.e. notability

Writing app

up to you, chats, zoom, phone, text etc

Collaboration

presentation

Keynote

polleveryhwhere

Polls

POLLS

When poll is active, respond at **PollEv.com/oliverknill392**

Where are you currently located?

www.knill.com/jams

links to
pollev.com/oliverknill392

NETIQUETTE

Listen for understanding

Be present with video

Be active in class!

Mute in noisy environment

Ask questions

Value respectful conversation

Be professional

Value diverse voices

What is Calculus?

Analyze data by analyzing their change, then use this to sum up data to predict the future.

Sometimes, we can then make a model

Story of Math (Athena production)

Predict the next step

1, 3, 5, 7, 9, ...

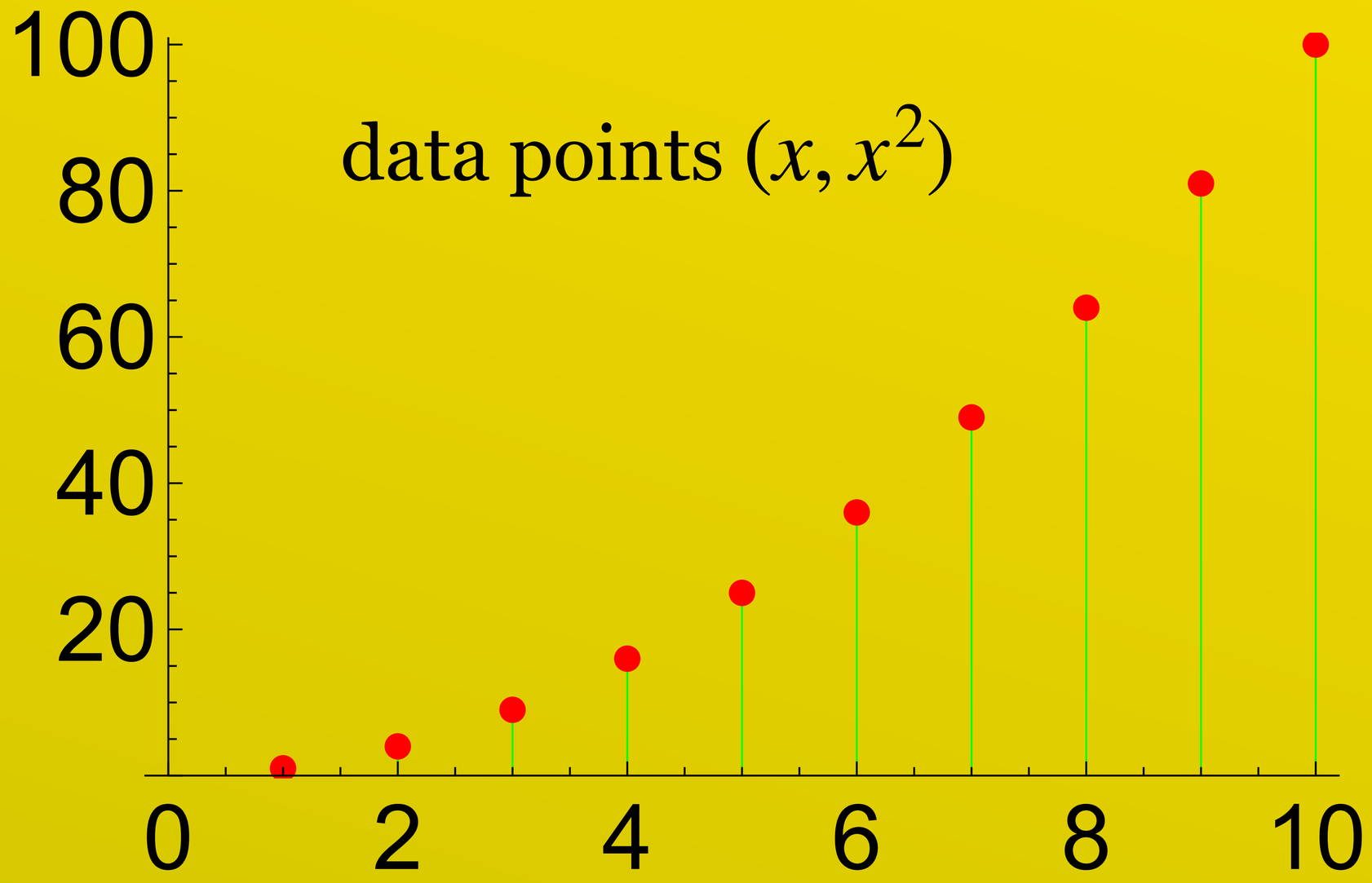
2,5,10,17,26,37,....

1,2,4,8,16,32,64,...

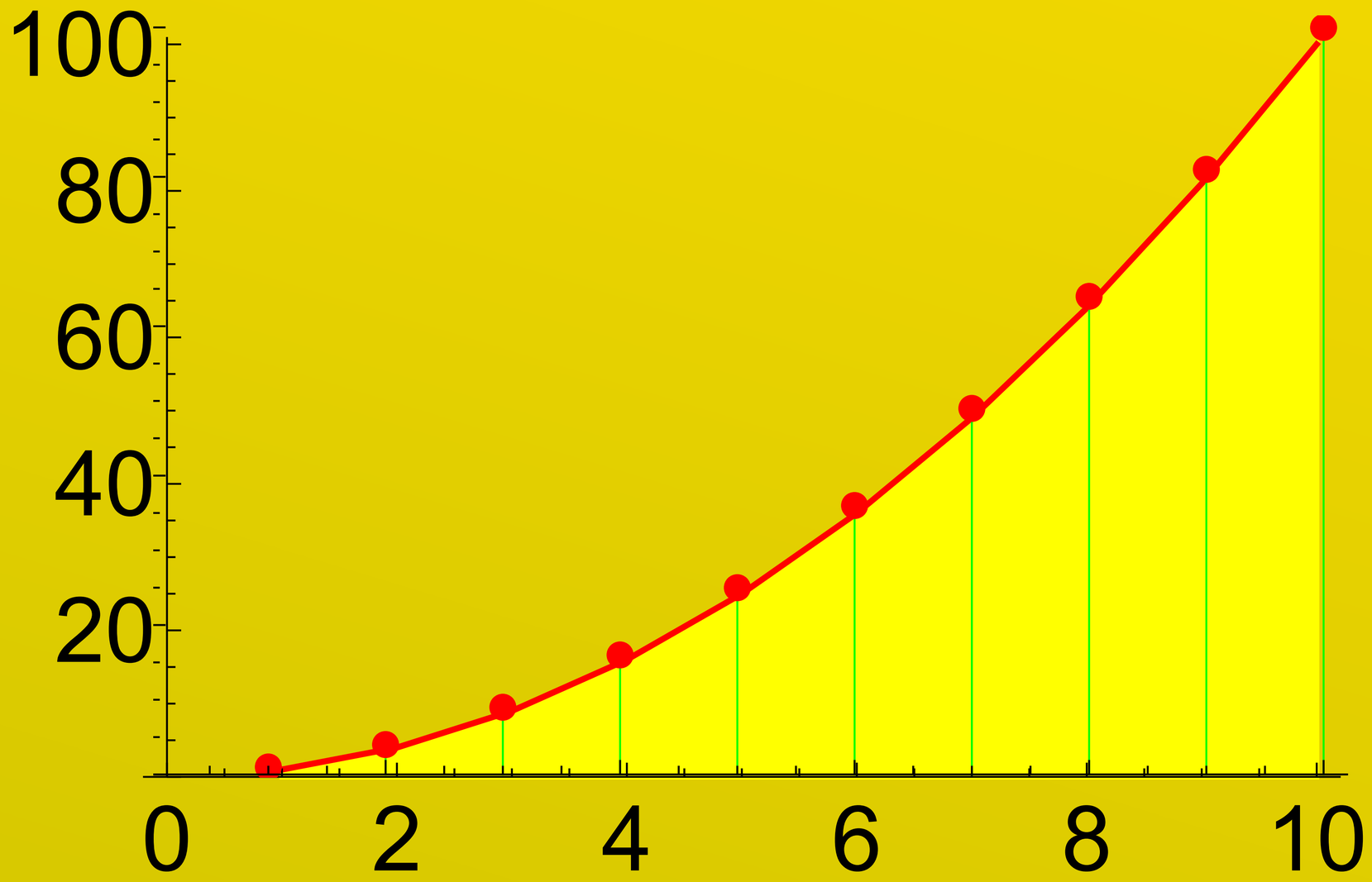
1,2,0,3,-1,4,-2,5,...

2,3,5,7,11,13,17,...

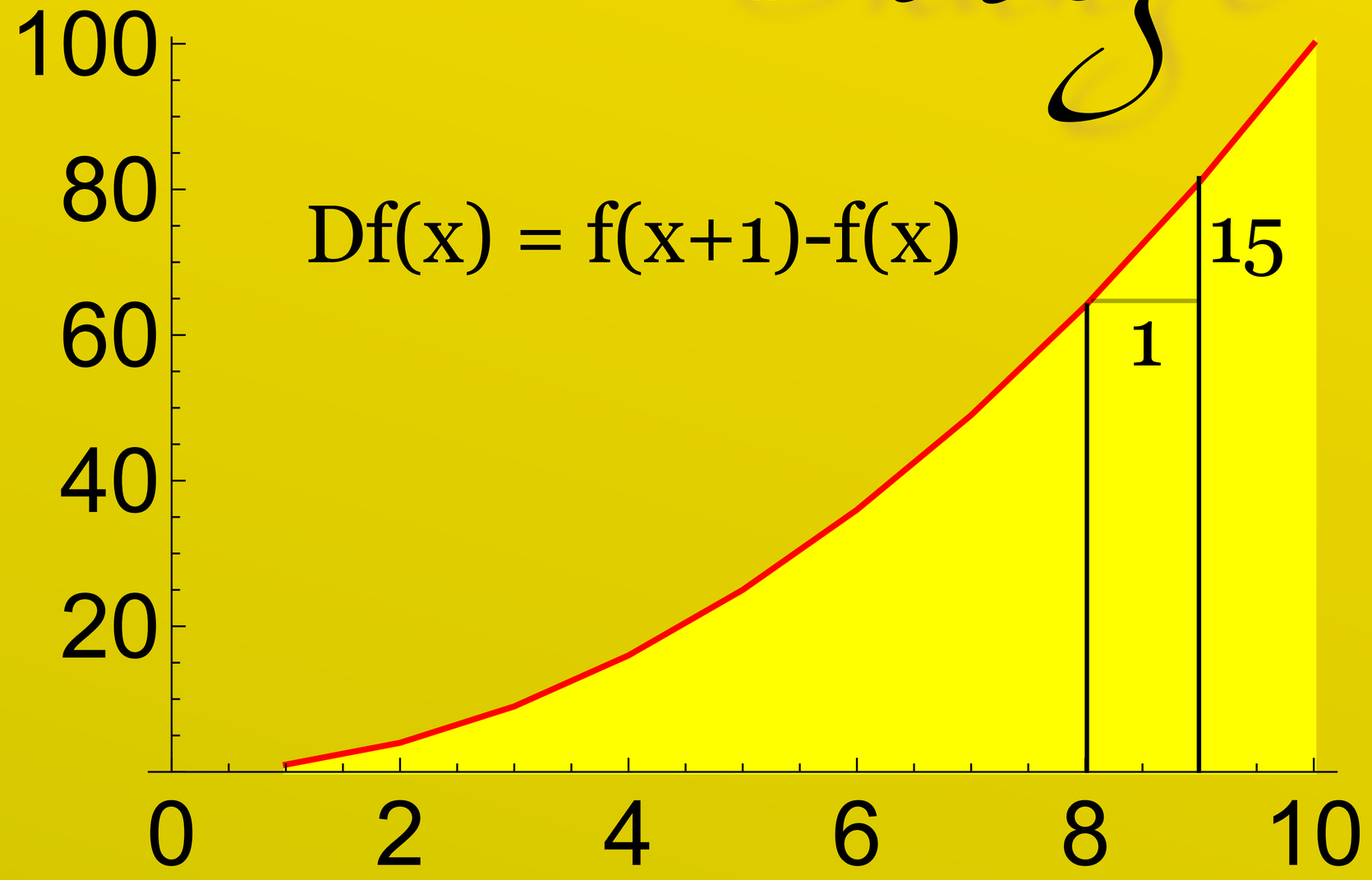
Functions



Functions



Change

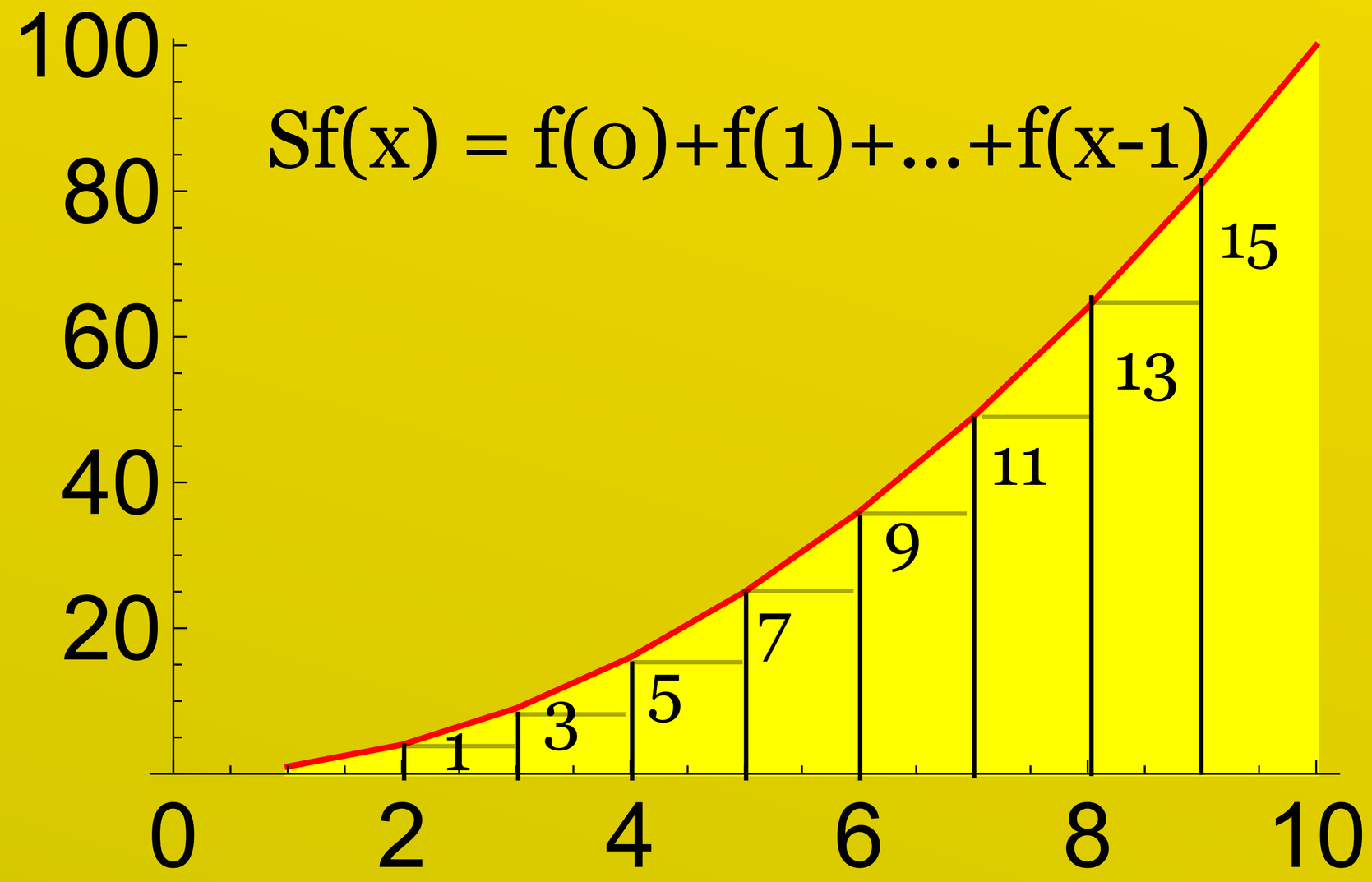


$f(x)=x^2$

Df(8)=f(9)-f(8)
=81-64=15

discrete
derivative
average rate of
change

Summation



$f(x)=x^2$

S Df(9)=1+3+5+...
+15=81

discrete
Integral

Summation

Jam

what is the next number?

f	0	1	14	51	124	245	426
Df							
D^2f							
D^3f							

IQ tests

Which number should be on the dots?

27 9 18 6 12 4 ...

A. 5
B. 6
C. 7
D. 8

And here

what is the next number?

f	2	1	-1	-2	-1	1	2	1	-1	
Df										
D^2f										
D^3f										

THE END