# LECTURE 2

Oliver Knill, Harvard University

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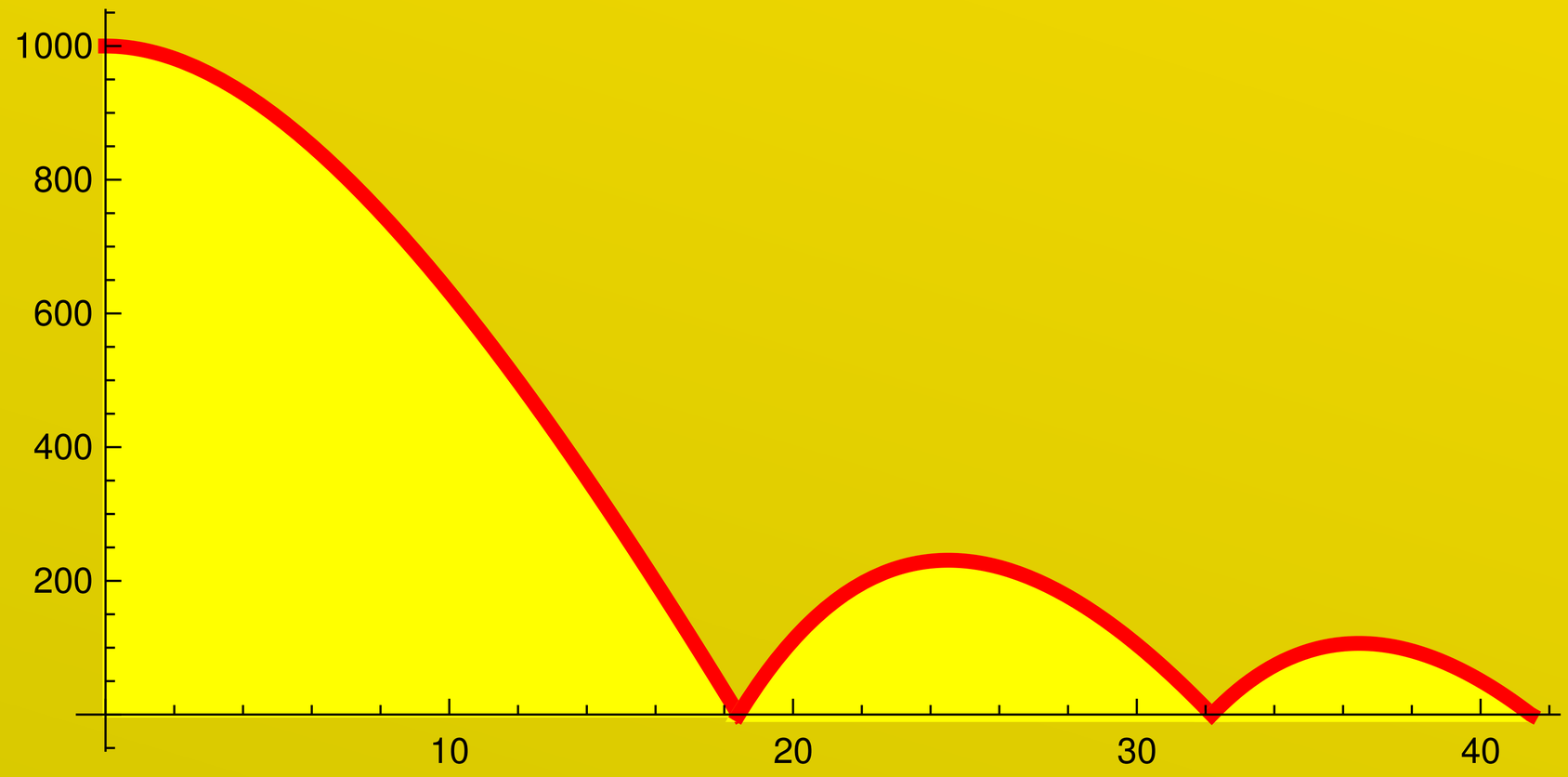
# PLAN

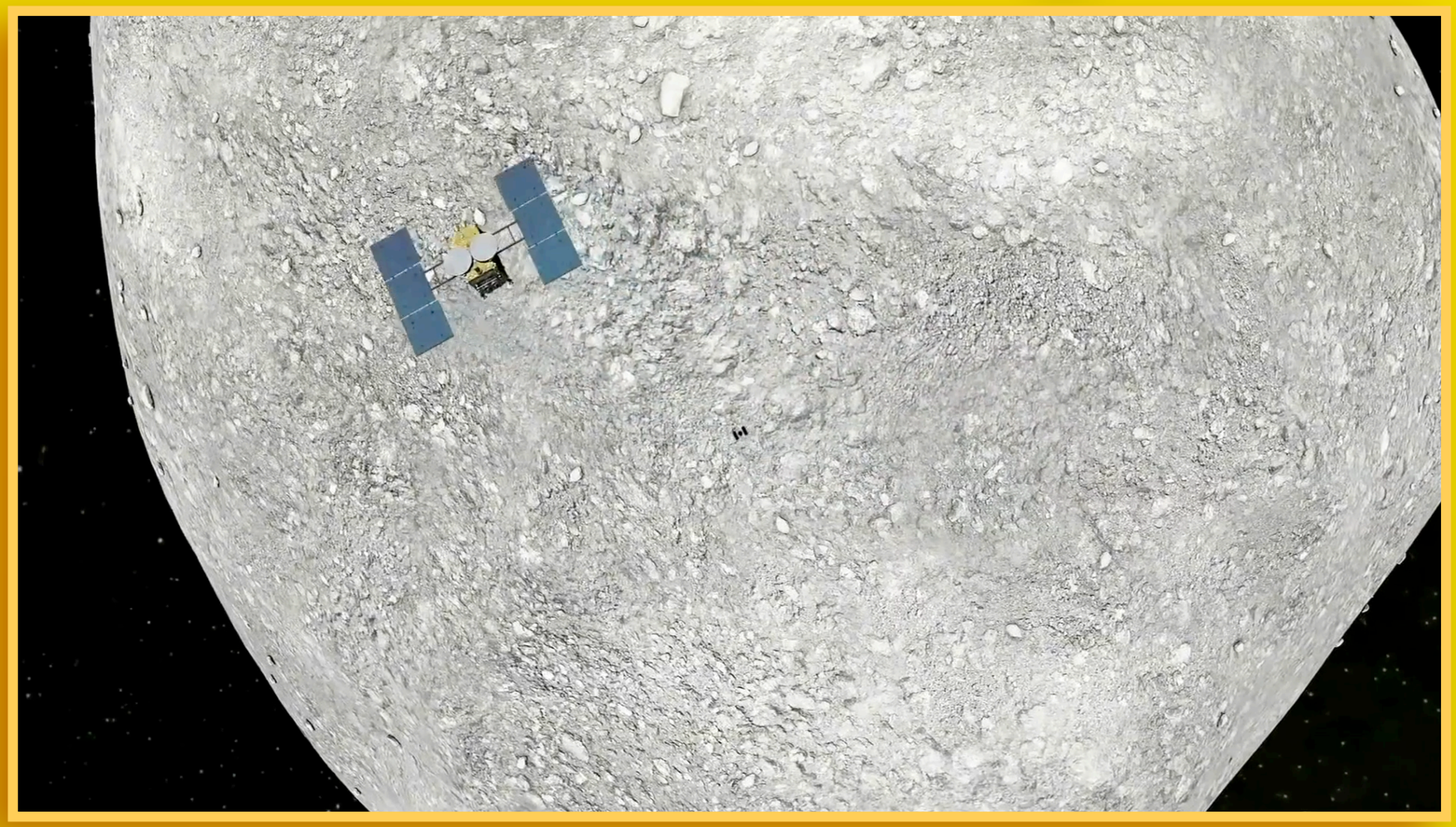
1. Function Poll, Review
2. Function Zoo
3. Plotting
4. Bungee jump
5. Daylight time
6. Tax System

# REVIEW BOUNCE



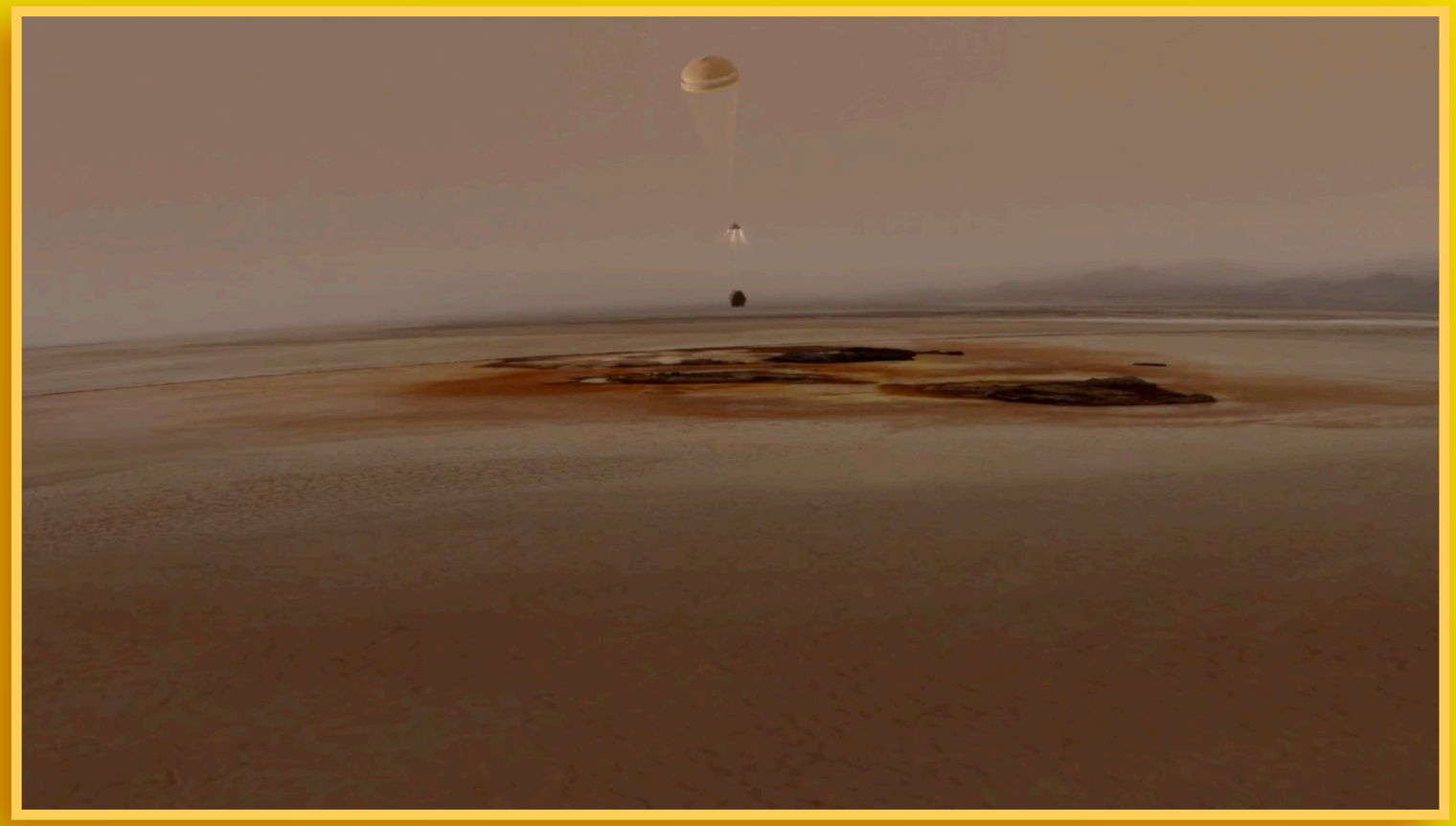
# DROPPING A SHELL

# BOUNCING ON ASTERIOD



# DAM BUSTERS

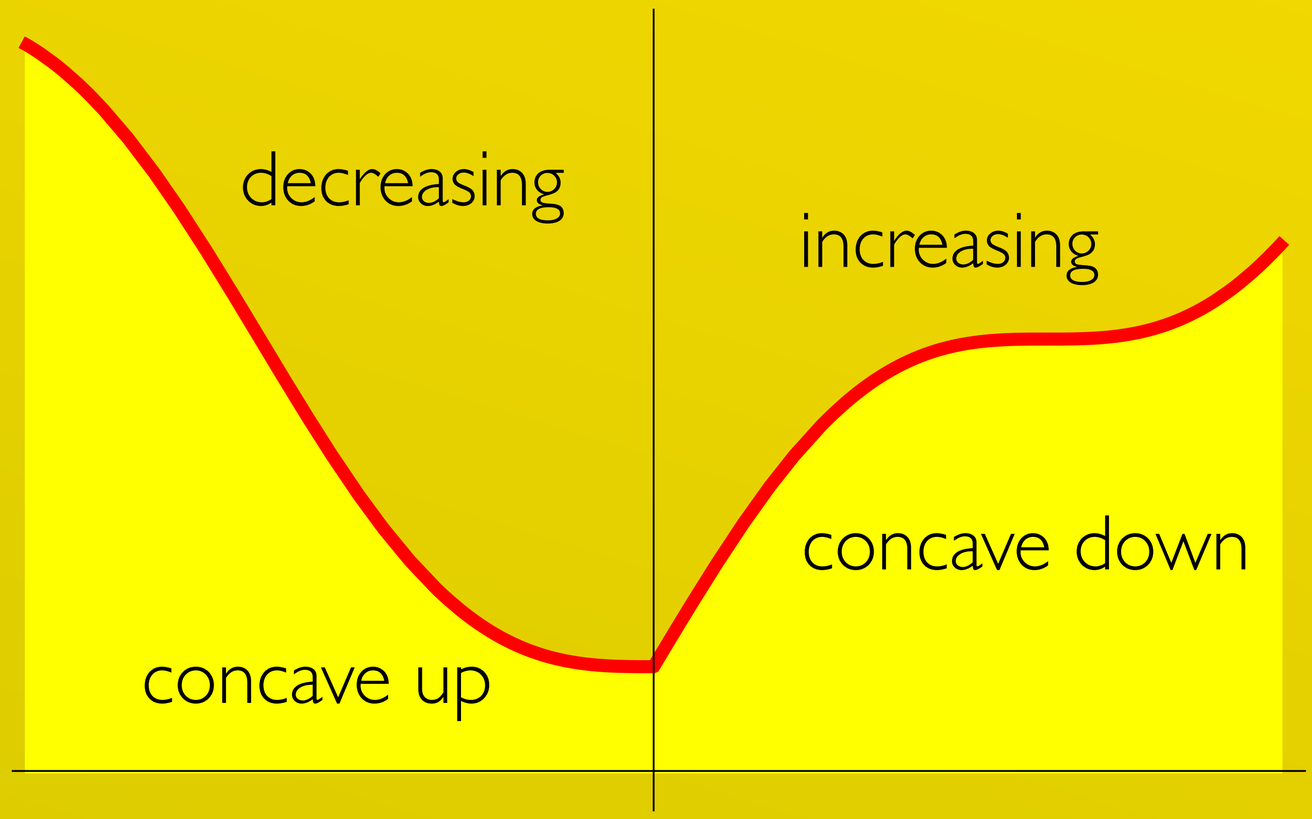
# MARS BOUNCE



# FUNCTION ZOO

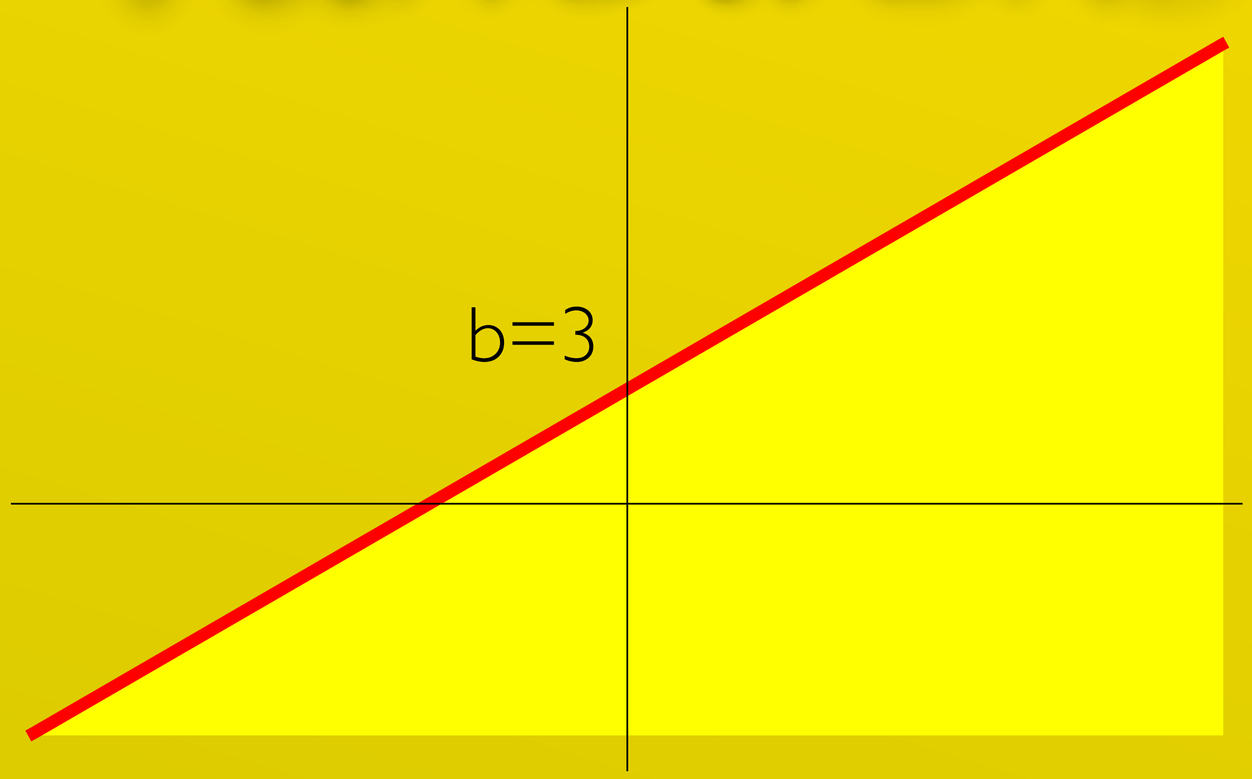
## GROW THEM LIVE IN CLASS

# FUNCTIONS




$$f(x) = |x| + \sin(x) + 1$$

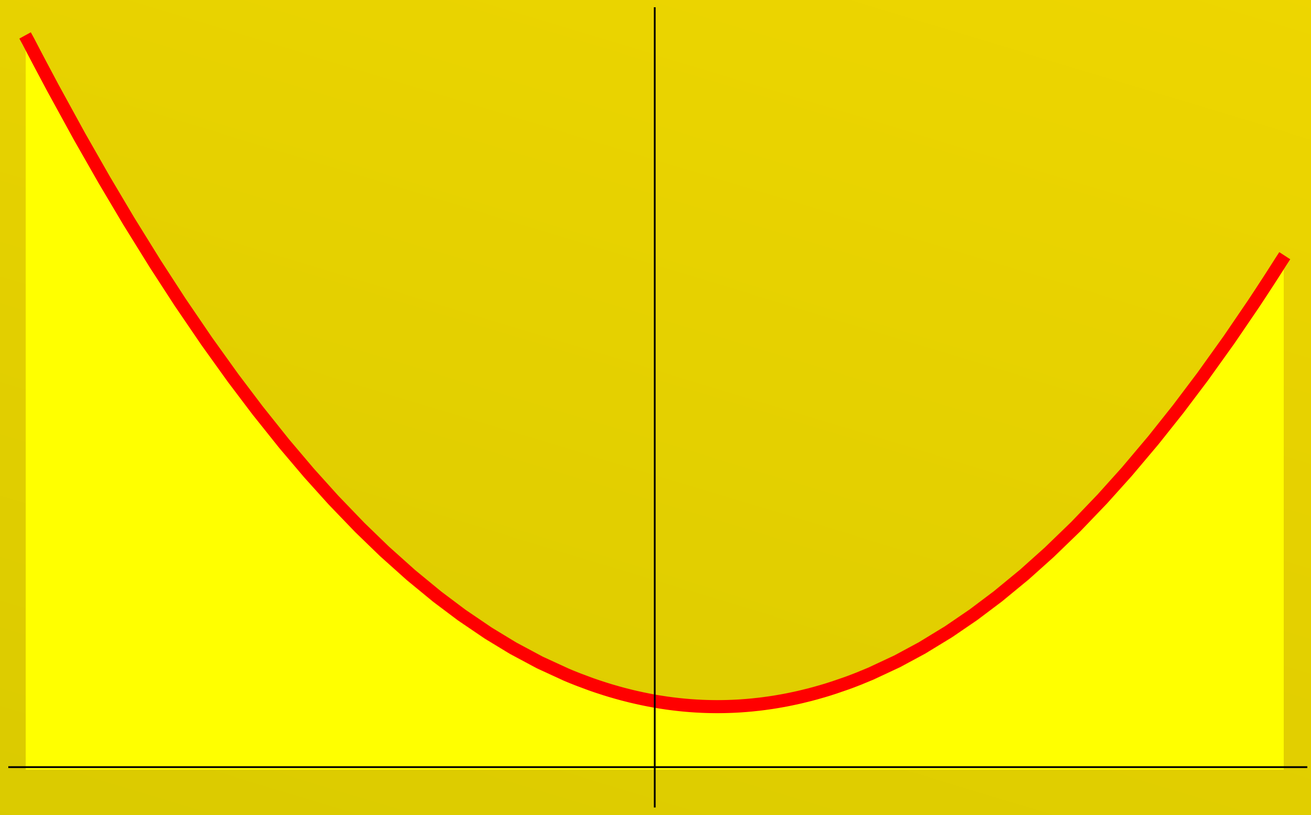
# LINEAR FUNCTIONS




$$f(x) = x + 3$$

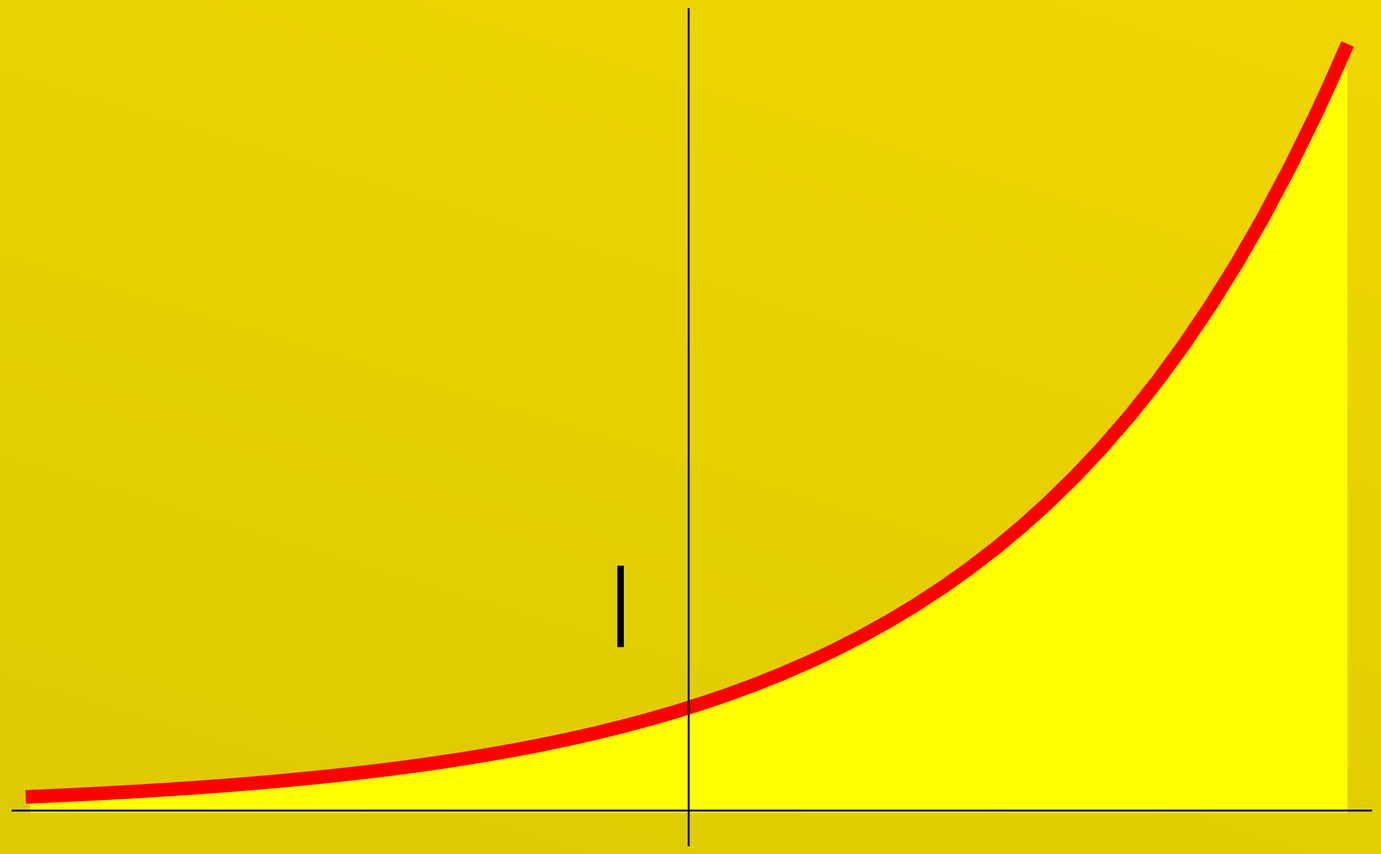
# POLYNOMIAL FUNCTIONS

$$f(x) = x^2 - x + 3$$



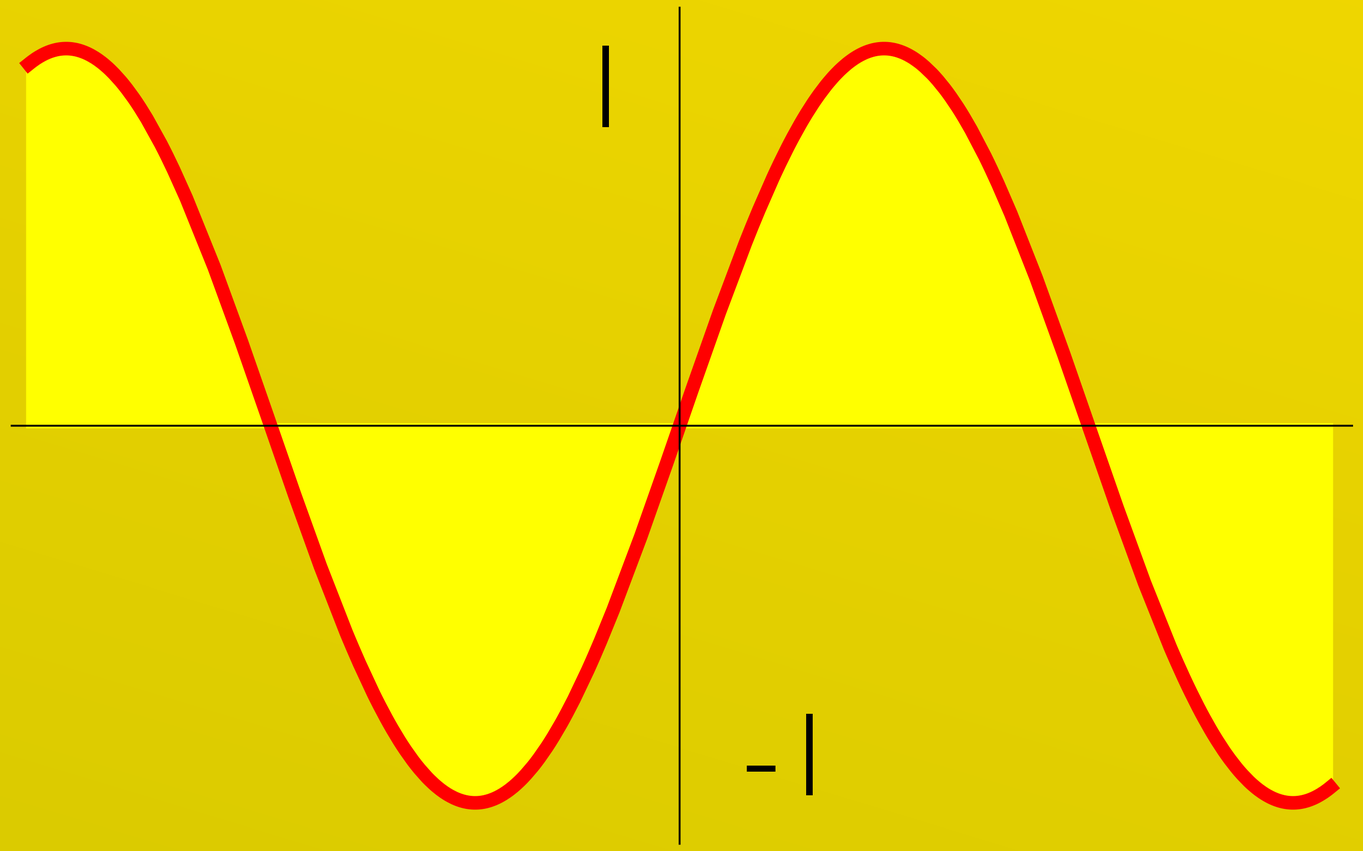
# EXPONENTIAL FUNCTIONS

$$f(x) = e^x = \exp(x)$$



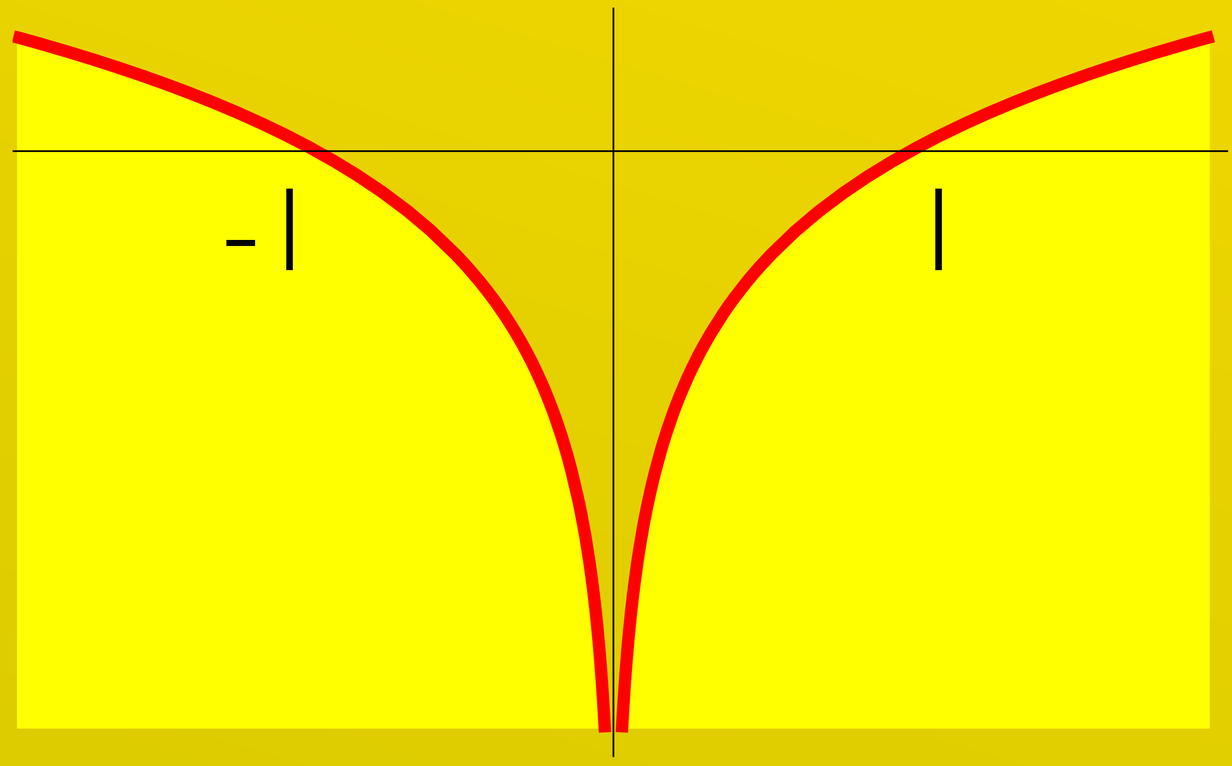
# TRIG FUNCTIONS

$$f(x) = \sin(x)$$



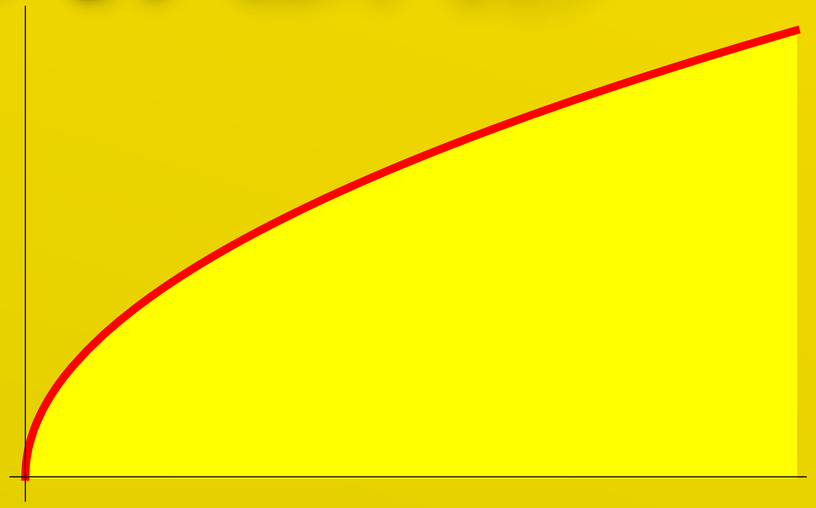
# LOG FUNCTION

$$f(x) = \ln|x| = \log|x|$$

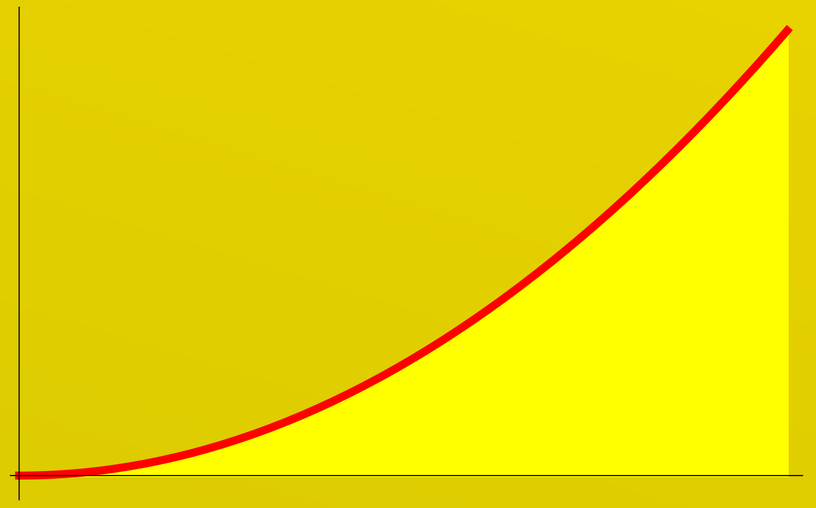


# INVERSE FUNCTIONS

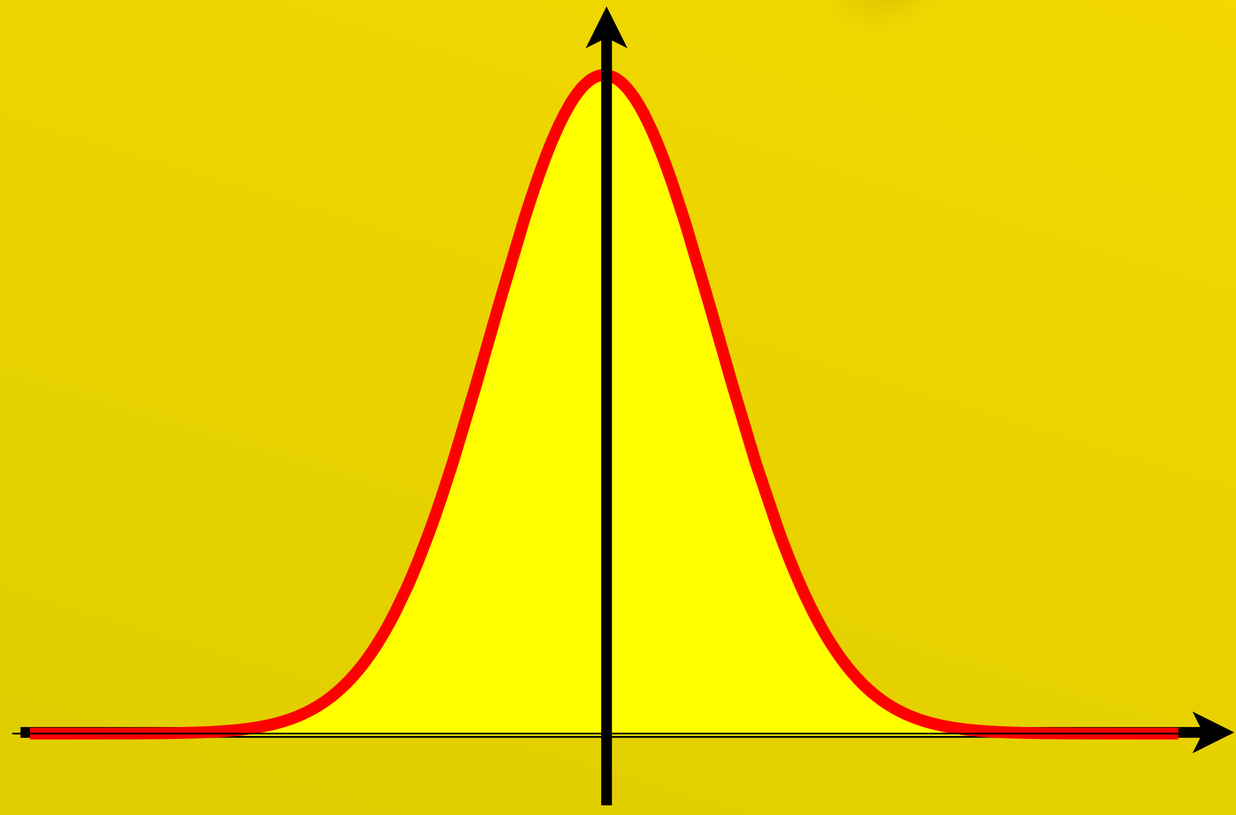
$$y = x^2$$



$$y = \sqrt{x}$$



# COMPOSING



$$f(x) = e^{-x^2}$$

# BELL CURVE

# *Functions*

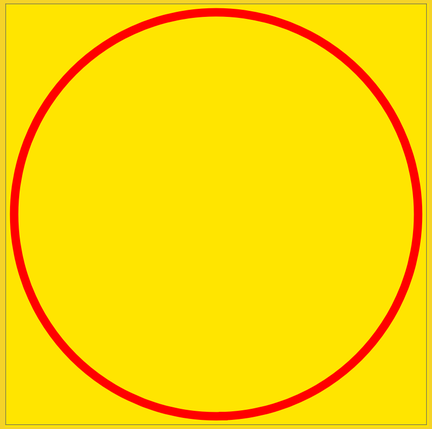
All you need is

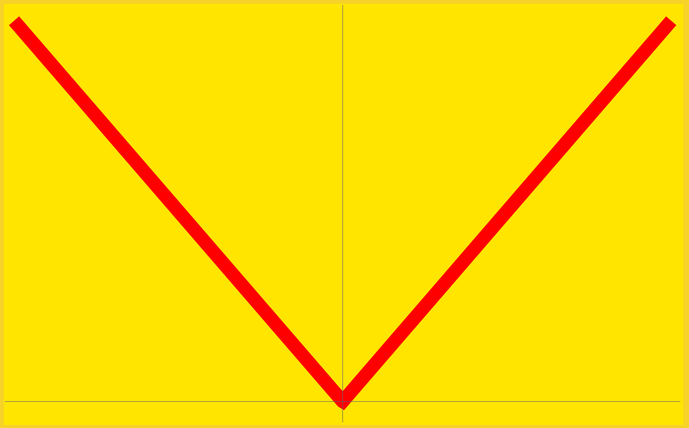
$y=1/x$

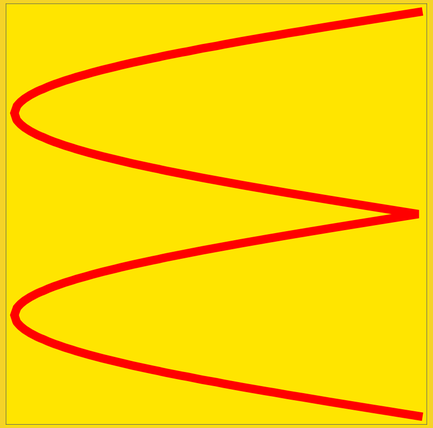
$x^2+y^2=1$

$y=|x|$

$x=-|\sin(y)|$







# MODELLING

# BUNGEE JUMP

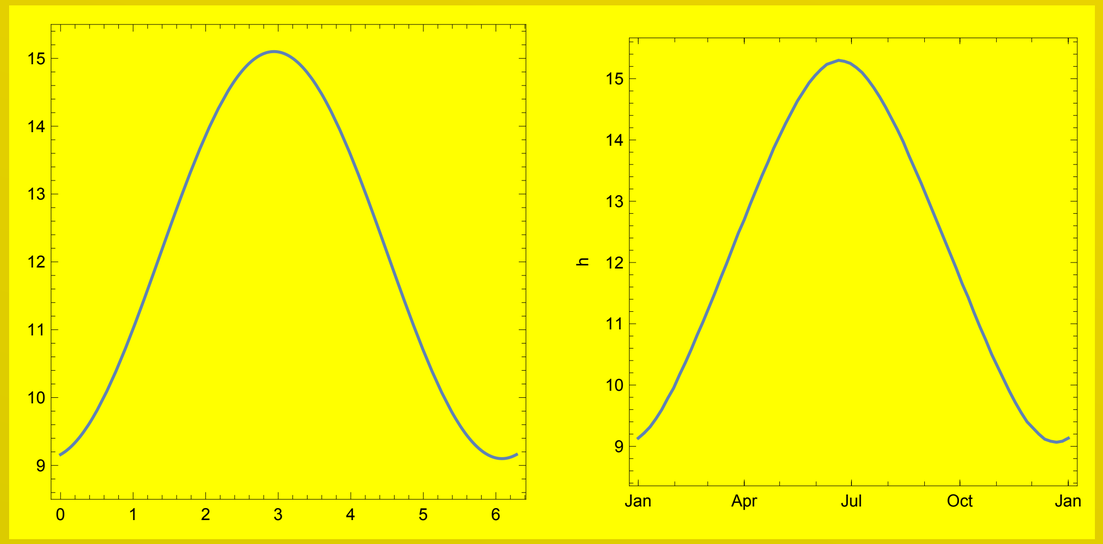
GOLDENEYE

YESMAN

BUNGY
BUNGY
BUNGY

# DAYLIGTH

# DAYLIGHT TIME

```
days = DateRange[{2019, 1, 1}, {2020, 1, 1}, {5, "Day"}];
A = Sunrise[days]; B = Sunset[days];
S1 = DateListPlot[
   TimeSeriesThread[UnitConvert[#[[2]] - #[[1]], "Hour"] &, {A, B}]]
S2 = Plot[12.1 + 3 Sin[x - Pi/2 + 0.2], {x, 0, 2 Pi}]
```

$$f(x) = 12 - 3\cos(x)$$