

WHAT IF YOU ARE MISTAKEN?

Why products managers need to
understand statistics

Anastasia Blazhenova

Let's sync!

About me

- Anastasia Blazhenova
- 2.5 yeas in Acronis as a product manager and analyst
- 1.5 years as a product manager in ManyChat
- Now product consultant and COO at RichPeach Media

UNCERTAINTY

**Would you invest \$100M
of your own money in
Apple just because you
love iPhones?**

Main metric

**Retention = how many
people stick to your
product after some time**

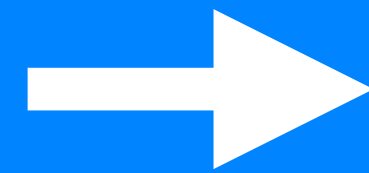
now

**feature A
helps new
users**

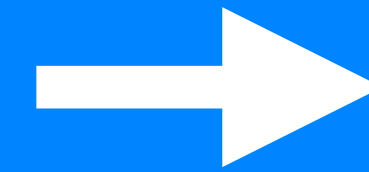


**they get
value from
ManyChat**

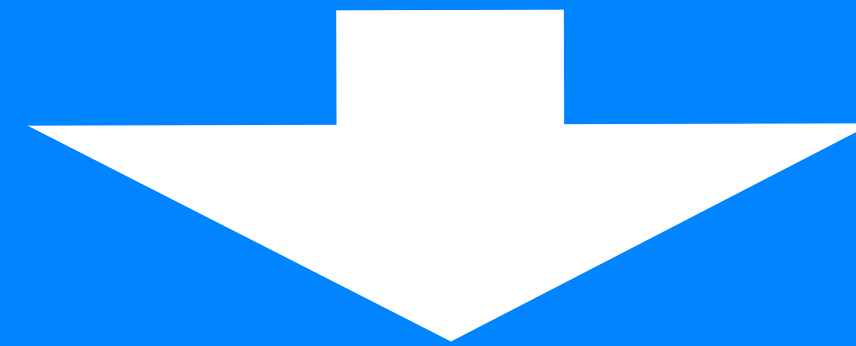
feature A helps new
users



they get value from
ManyChat



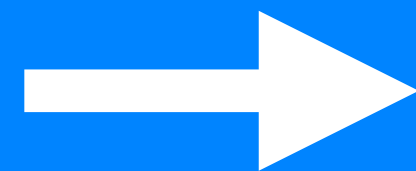
stay longer



IF

THEN

we
improve
feature A



more new users will
get more value from
ManyChat

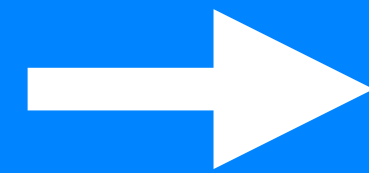


They will stay
longer and
retention will
grow

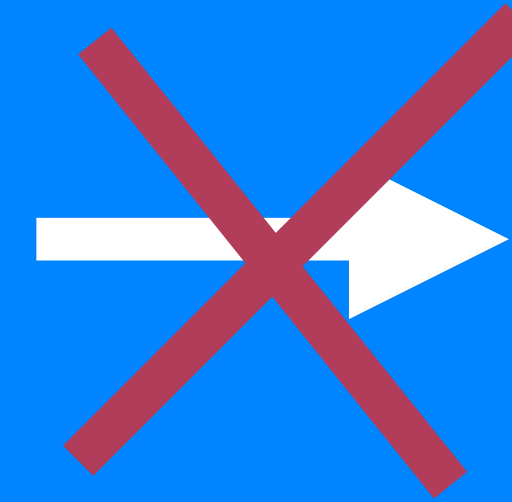




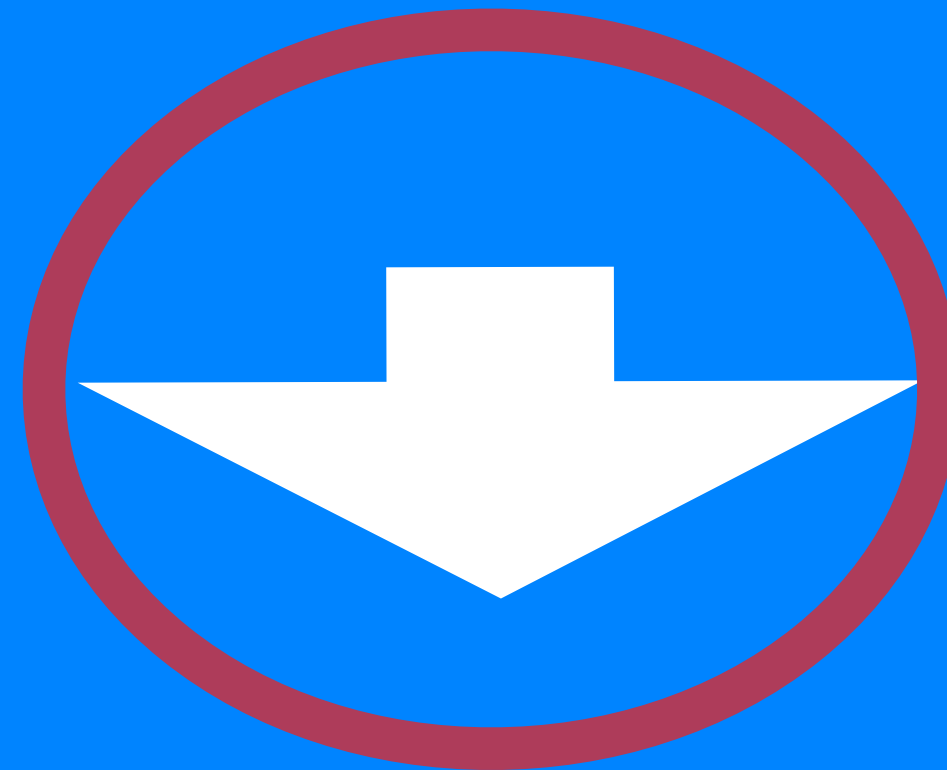
feature A helps new users



they get value from ManyChat



stay longer

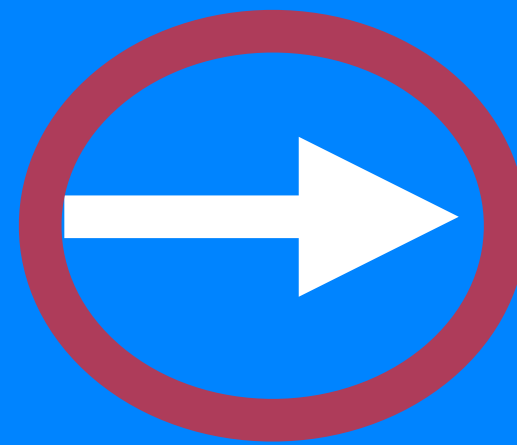


???

IF

we improve feature A

???



THEN

more new users will get more value from ManyChat



They will stay longer and retention will grow

???

???

???

- ✓ Why does one need statistics?
- ✓ When does one need statistics?
- ✓ What to do when you need statistic?

BASIC SKILLS

Comparing groups

Forecasts

Rise or drop

Average

Situation №1

Comparing groups

Group 1

50 customers

**20 used the new
feature**

Group 2

50 customers

**25 used the new
feature**



**Always 10 candies
in a package**

Only 2 colours:

GREEN YELLOW

Package 1



4 GREEN

6 YELLOW

Package 2



7 GREEN

3 YELLOW

**Were the 2 packages
intentionally produced
with different green-
yellow proportions?**

Group 1

50 customers

From Facebook Ad

**20 used the new
feature**

Group 2

50 customers

From Google Adwords

**25 used the new
feature**

**Are customers from
Google Adwords channel
more likely to prefer the
feature?**

Confidence interval for a population

$$\hat{p} \pm 1.96 * \sqrt{\frac{\hat{p}(1 - \hat{p})}{n}}$$

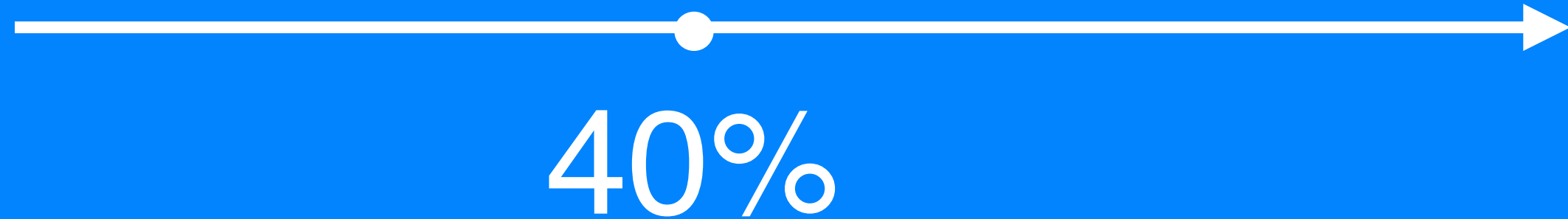
your proportion

For 95% confidence

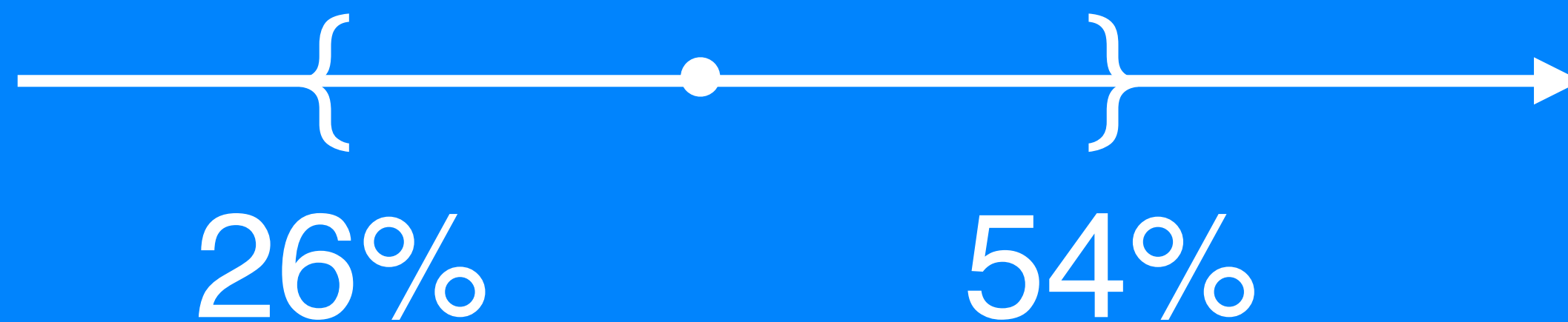
Sample size

Facebook Ads

Adoption for 50 ppl

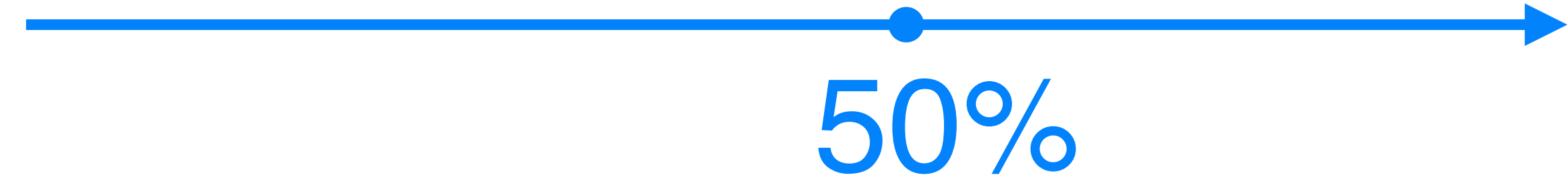


Adoption for population

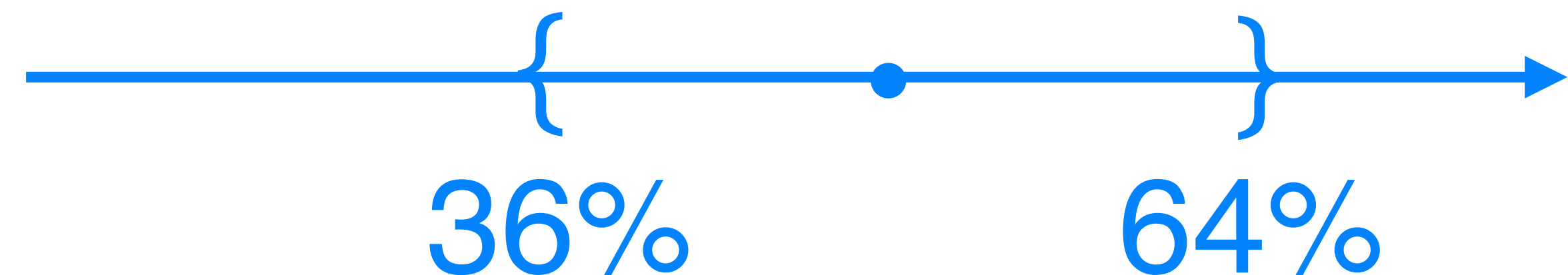


Google Adwords

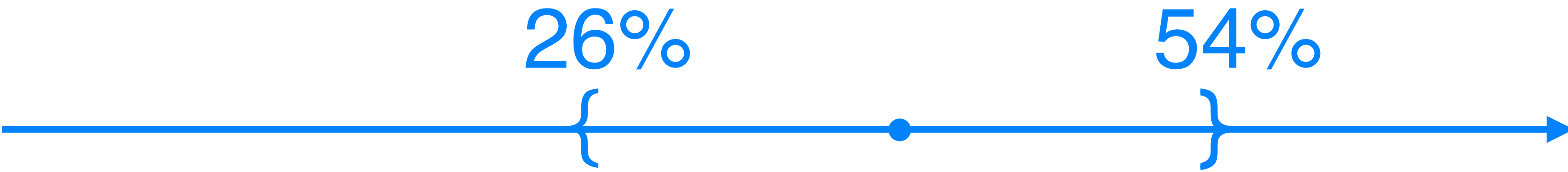
Adoption for 50 ppl



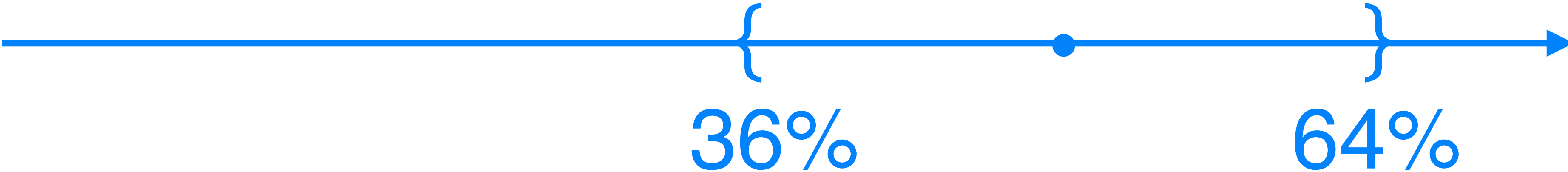
Adoption for population



Facebook
Ads



Google
Adwords



Chi-square

T-test

ANOVA

25 > 20, but

30% possibility

**that Google Adword group
didn't perform better**

Do you use NPS?

Save time

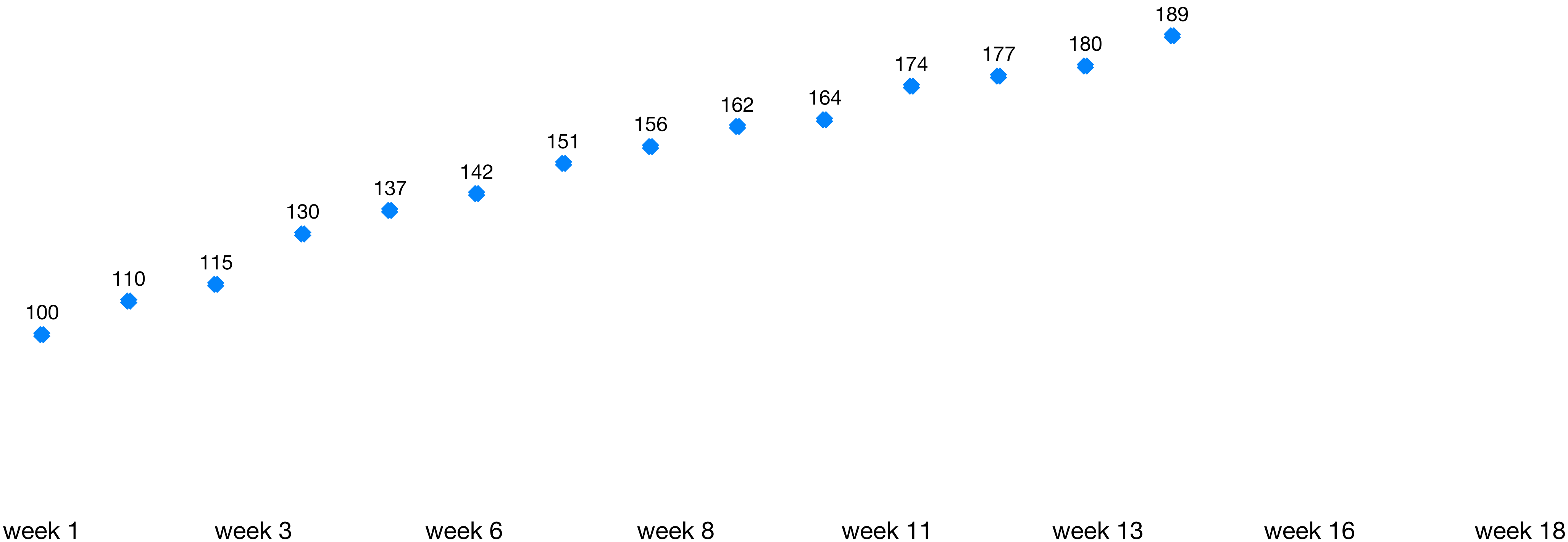
**on things that are not
likely to work**

Situation №2

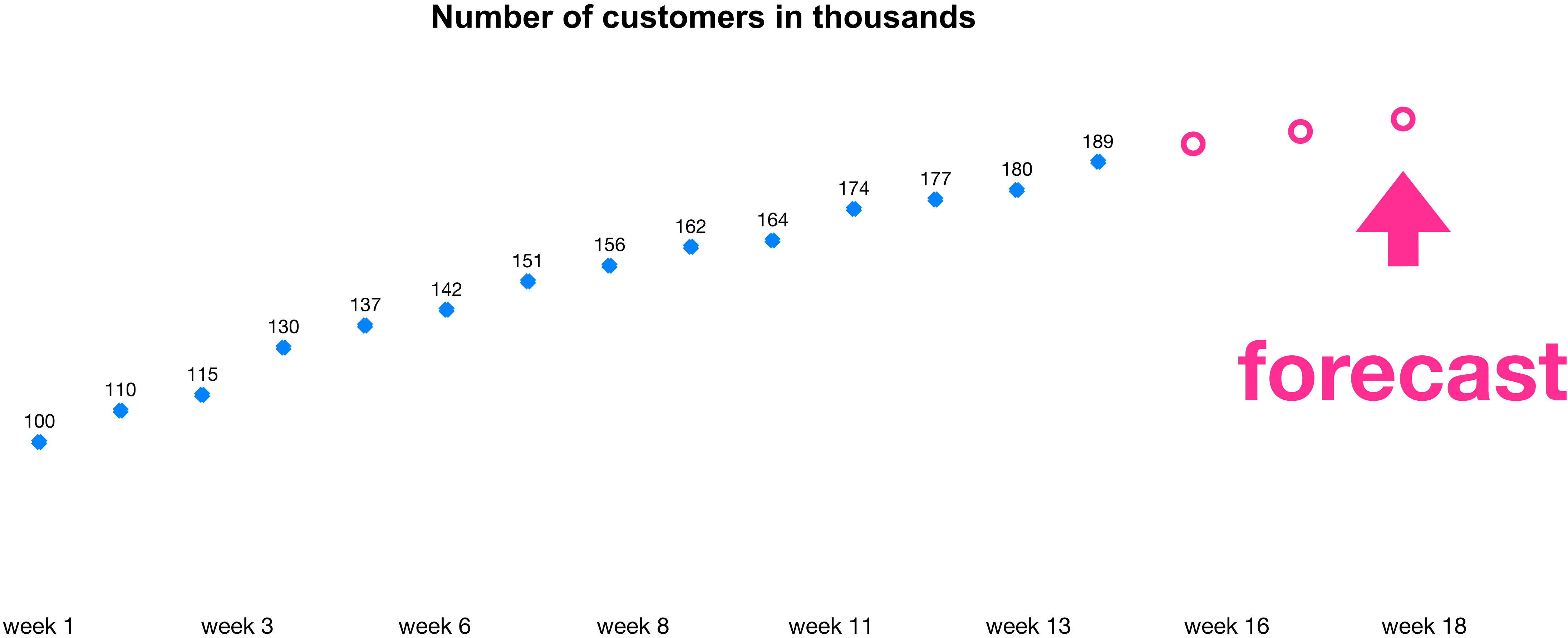
Forecasts

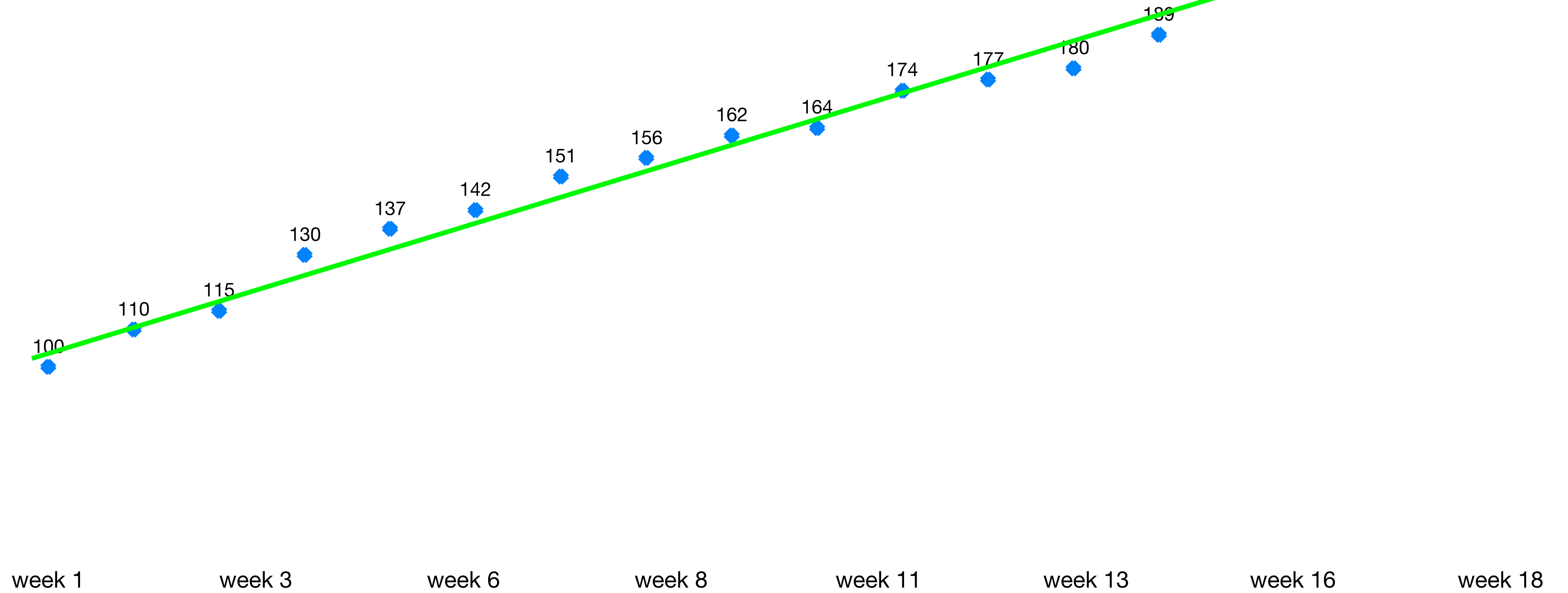
How many customers will the company have in 6 months' time?

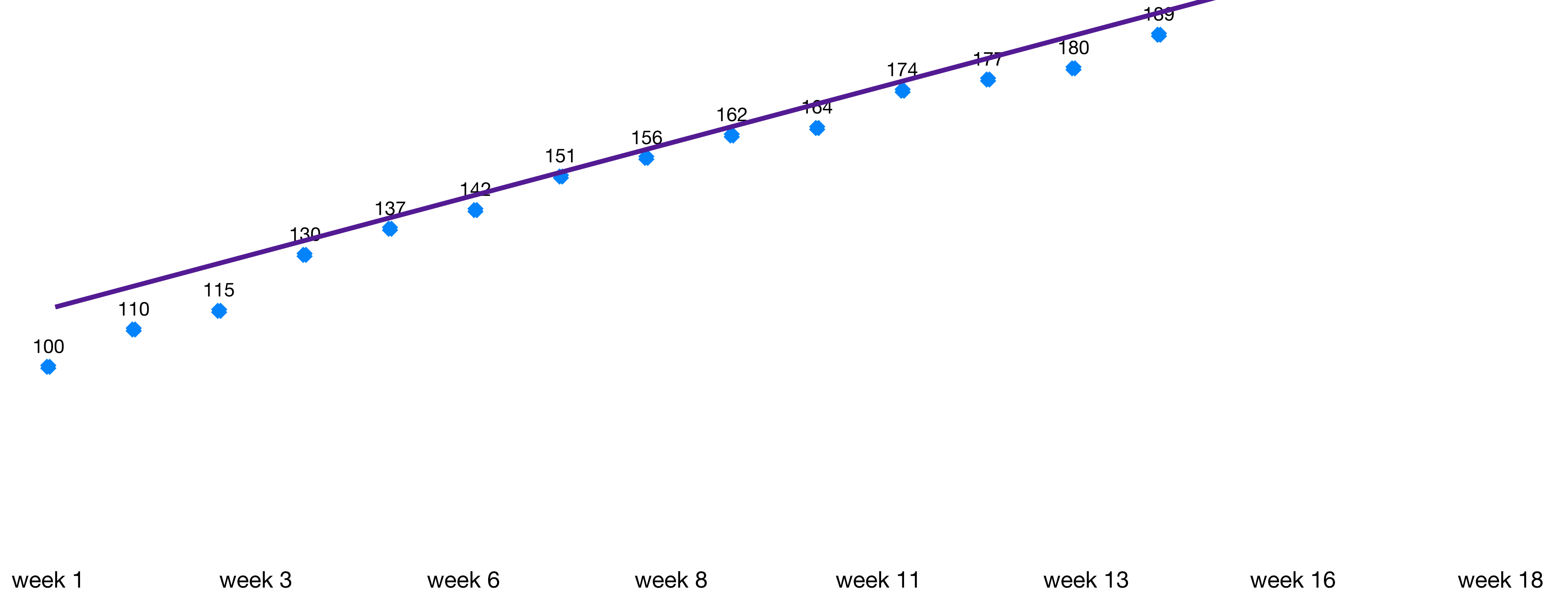
Number of customers in thousands

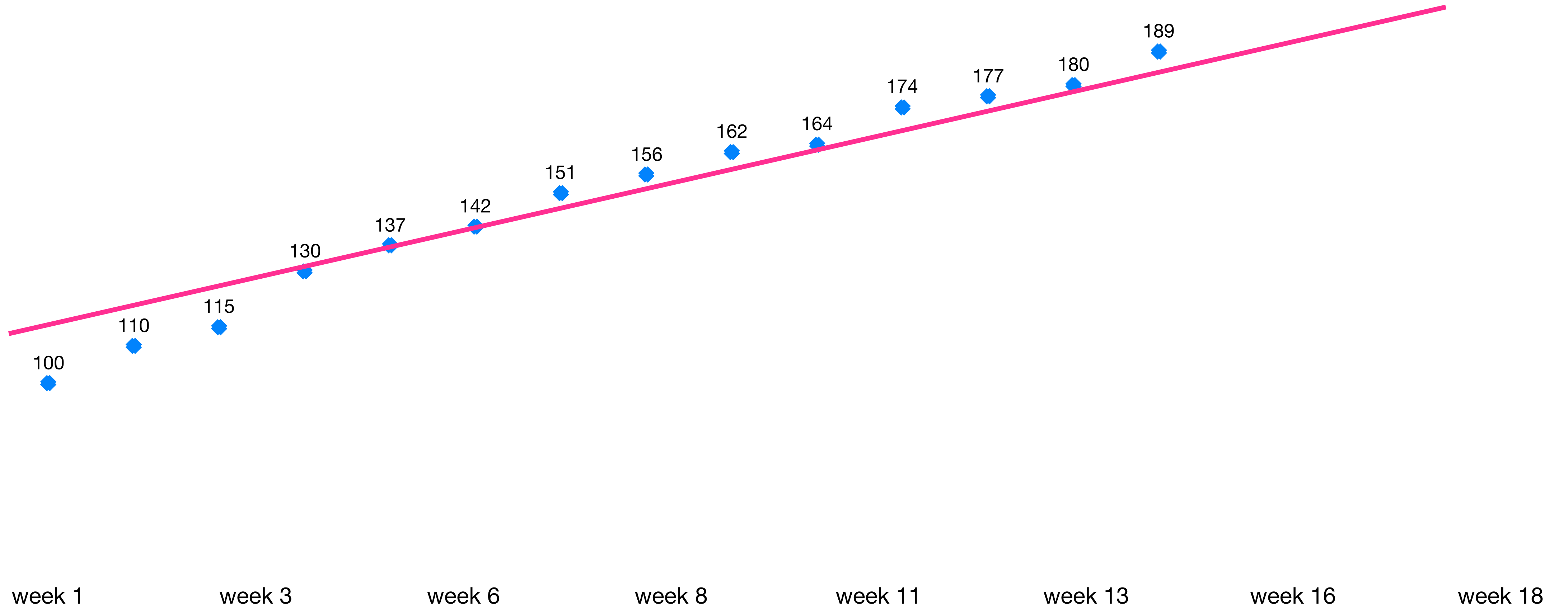


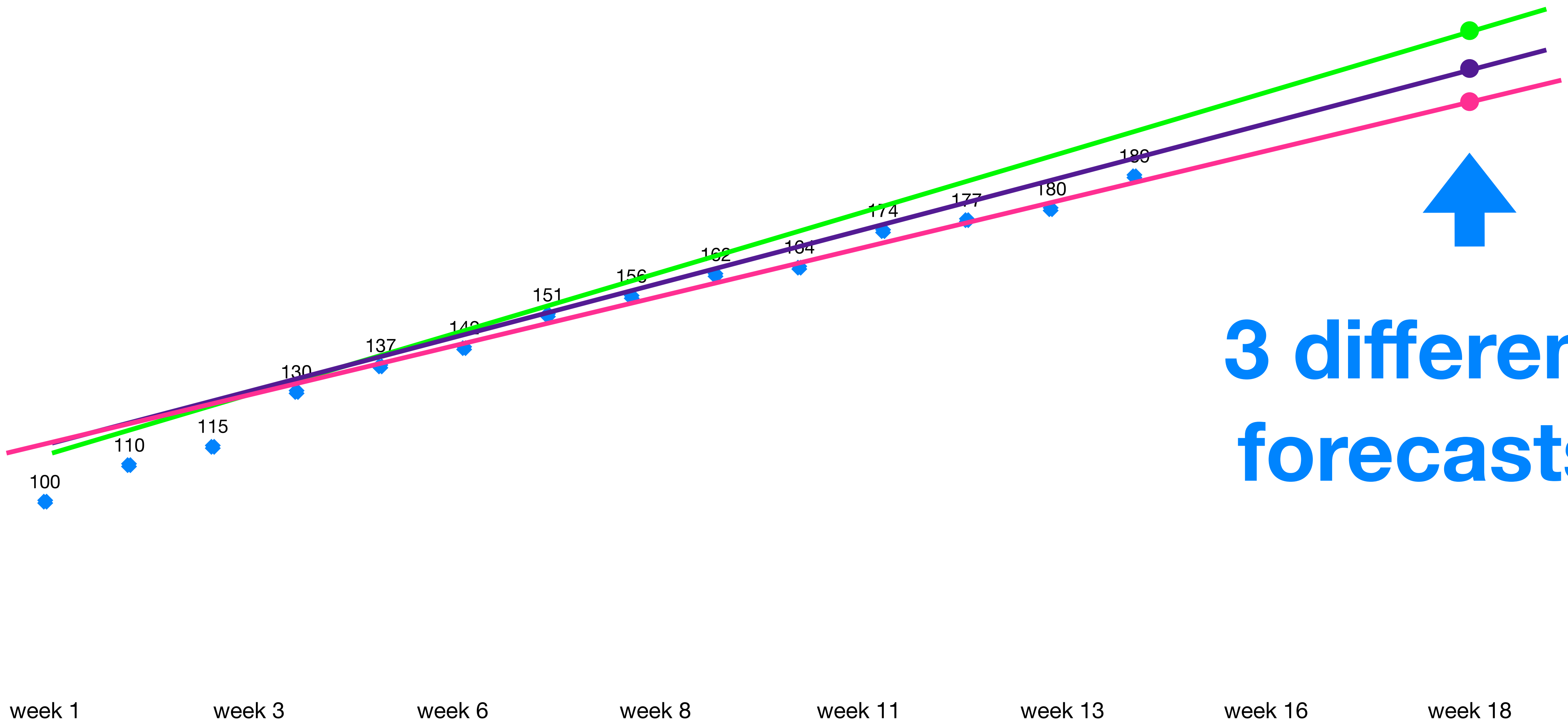
How many customers will the company have in 6 months' time?











**3 different
forecasts**



Linear regression

Storage in DC
Number of customers **= $k_1 \times \text{month} + k_2$**
Revenue

Number of customers = $1.2 \times \text{month} + 11,500$

ALWAYS

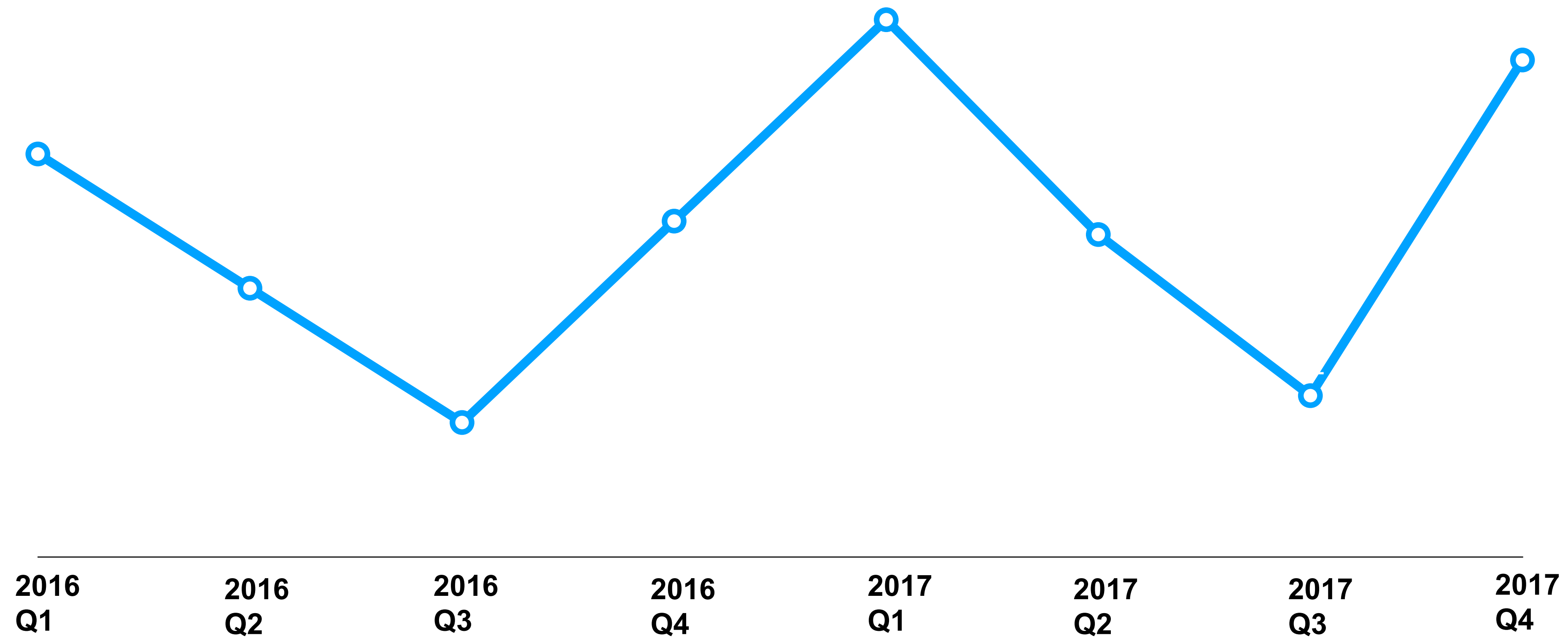
Check data criteria

Study all output info

Study all output info

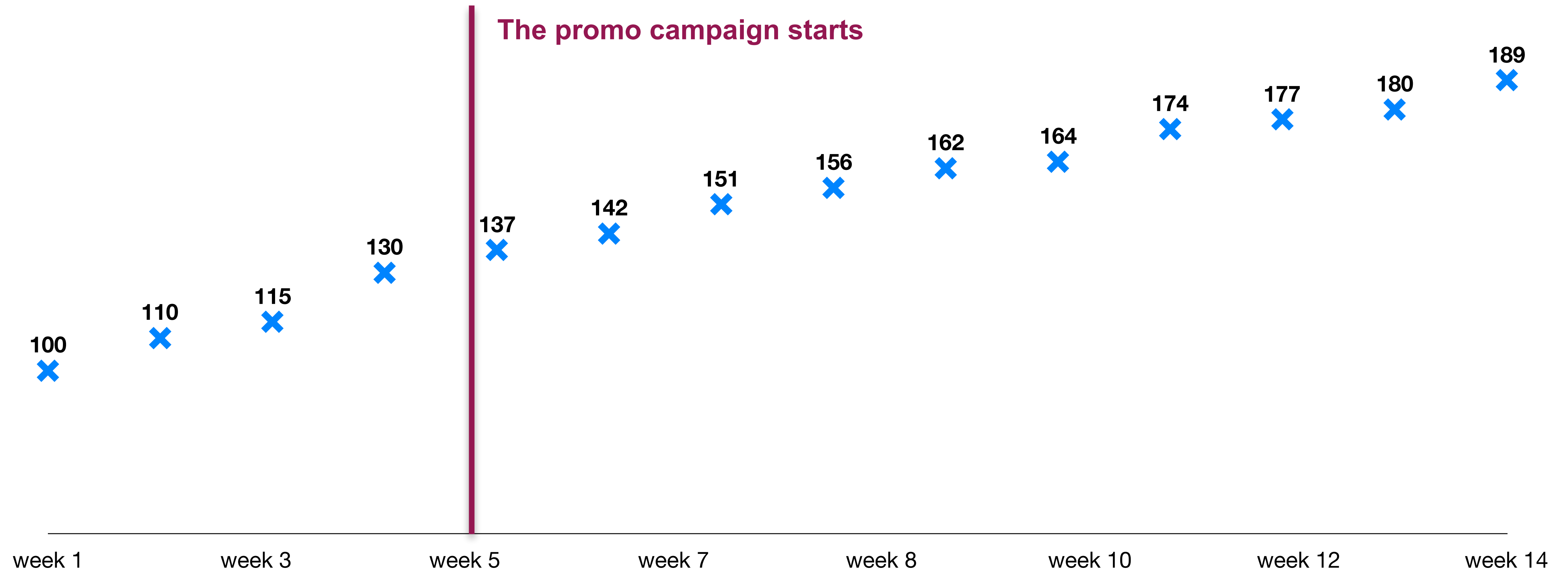
0	Regression Statistics								
1	Multiple R	0.97530483							
2	R Square	0.951219512							
3	Adjusted R S	0.853658537							
4	Standard Err	0.191273014							
5	Observation	4							
6									
7	ANOVA								
8		<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>			
9	Regression	2	0.713414634	0.356707	9.75	0.220863052			
10	Residual	1	0.036585366	0.036585					
11	Total	3	0.75						
12									
13		<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95.0%</i>	<i>Upper 95.0%</i>
14	Intercept	3.146341463	0.790522384	3.980079	0.156708	-6.898197794	13.19088072	-6.89819779	13.19088072
15	House	-0.646341463	0.362905921	-1.78102	0.325702	-5.257498391	3.964815464	-5.25749839	3.964815464
16	Sq ft	0.024390244	0.009089707	2.683282	0.227104	-0.091105437	0.139885925	-0.09110544	0.139885925

Seasonal data



TRUE LIFE STORY

Did the promo campaign generate any revenue?



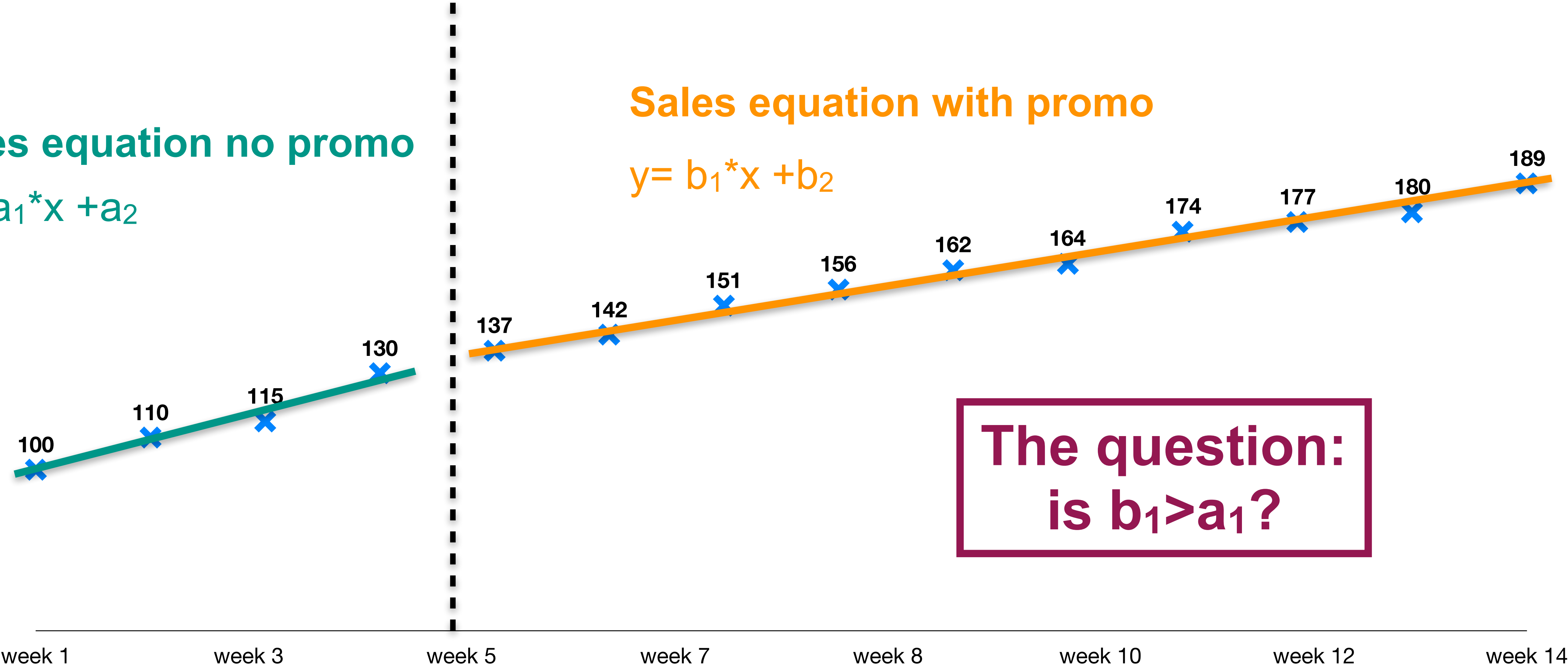
Sales equation no promo

$y = a_1 \cdot x + a_2$

Sales equation with promo

$y = b_1 \cdot x + b_2$

The question:
is $b_1 > a_1$?

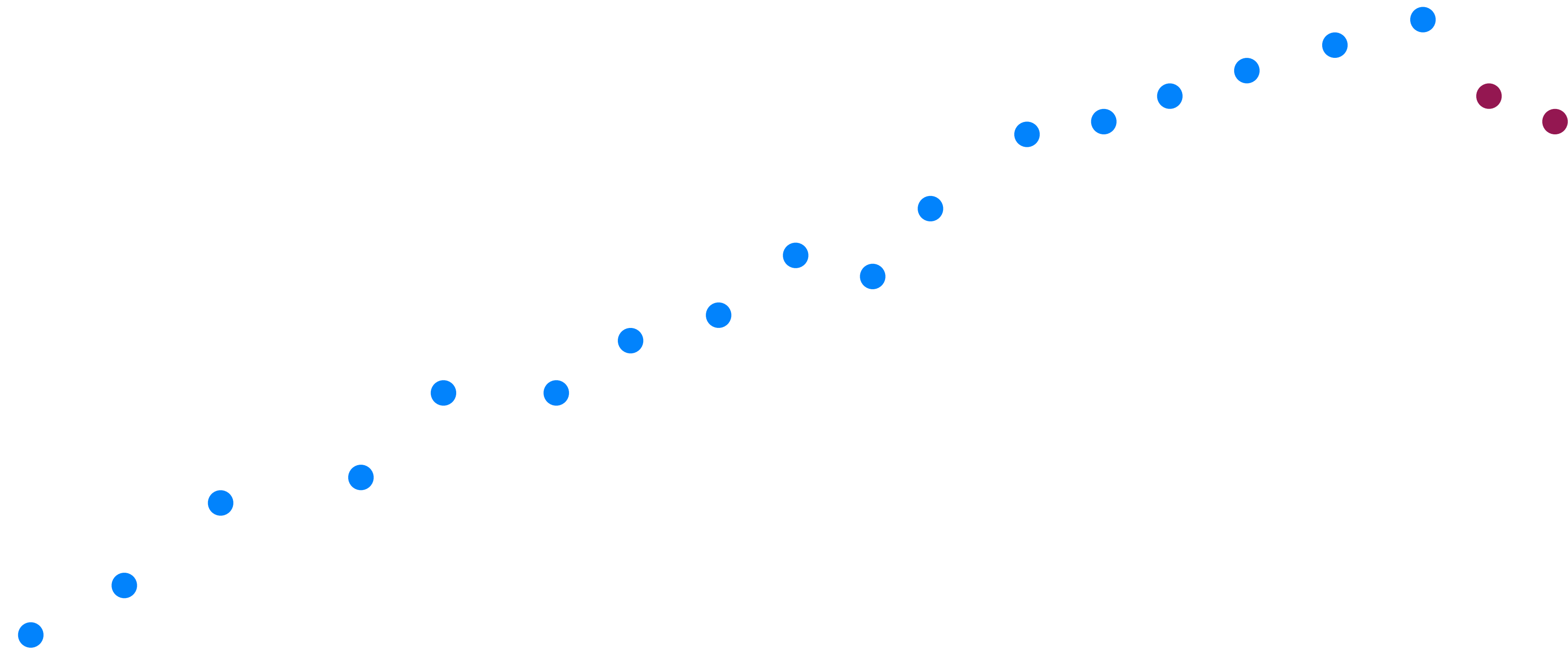


Situation №3

Ups & Downs

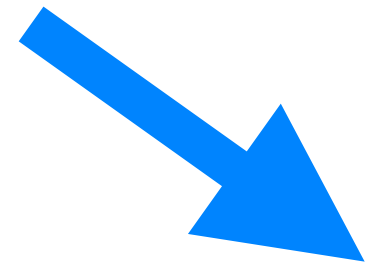


time

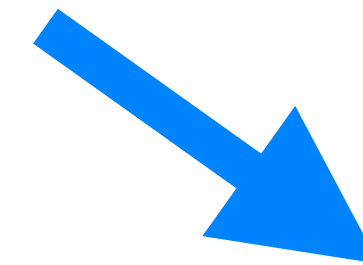


wtf???

**OMG,
we have a drop!**



**It was probably
because of that or that**



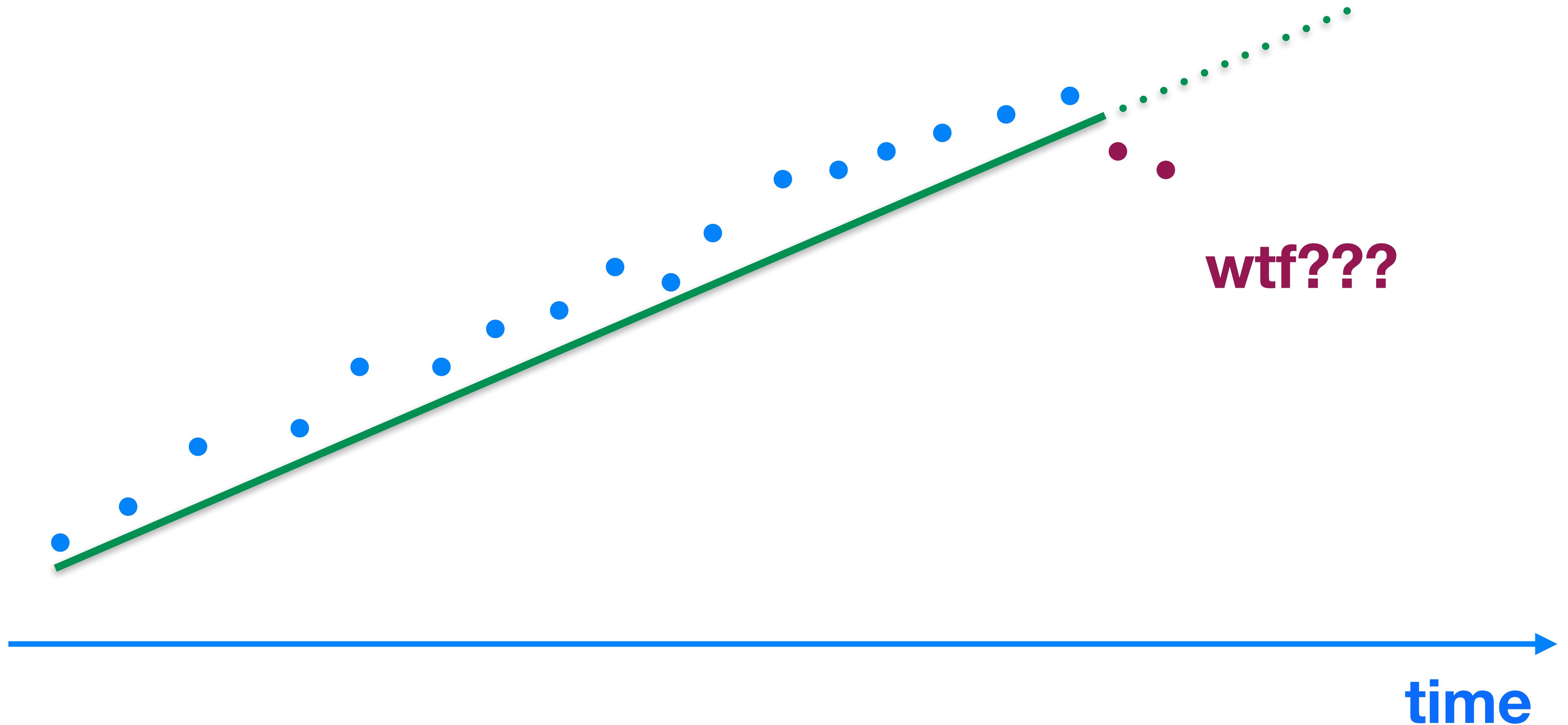
Let's try to fix it like this

Take things slowly

1

**Divide high level
metric into sub-data**

2 Check with the forecast



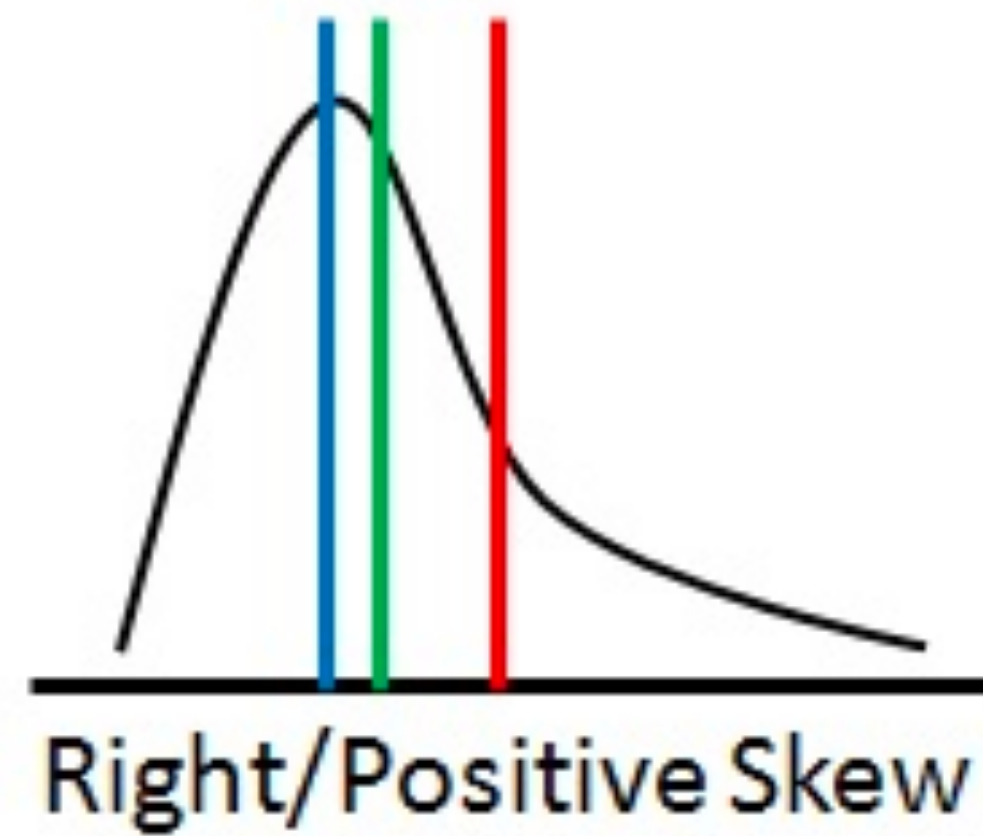
3 Don't forget cohorts

Situation №4

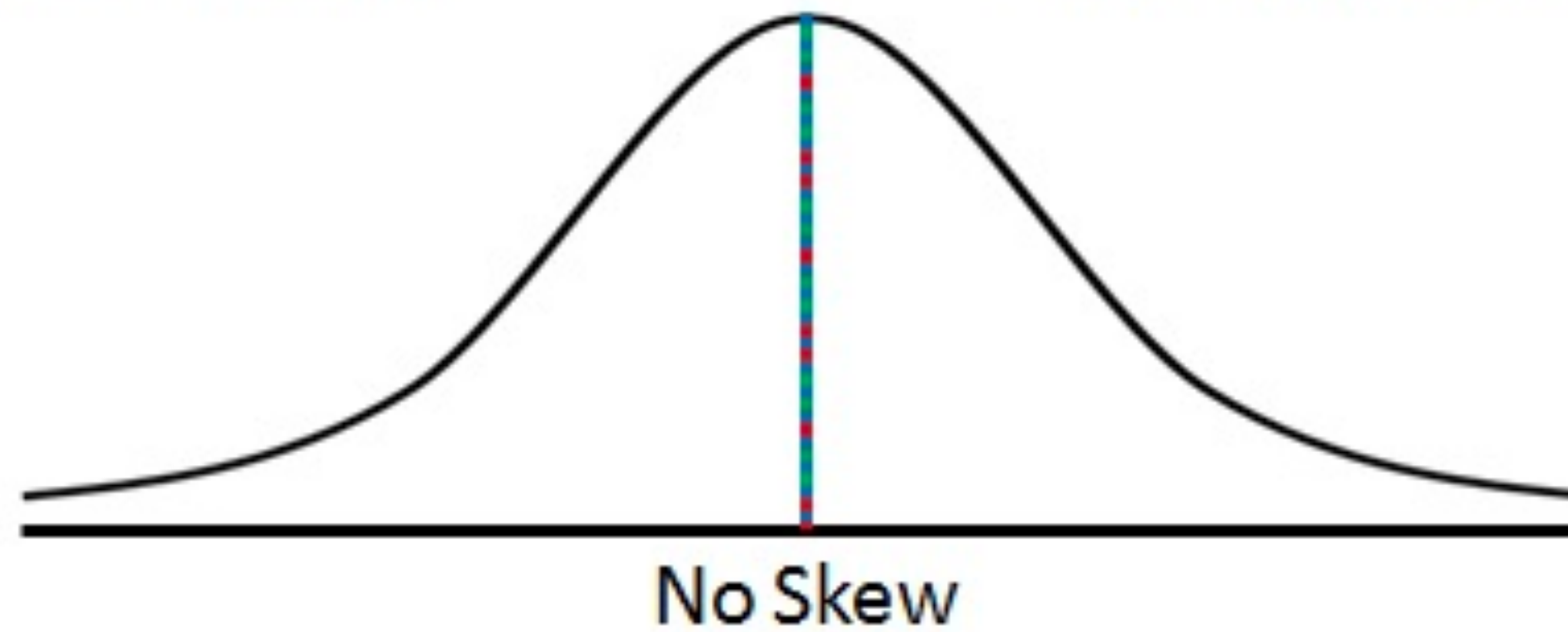
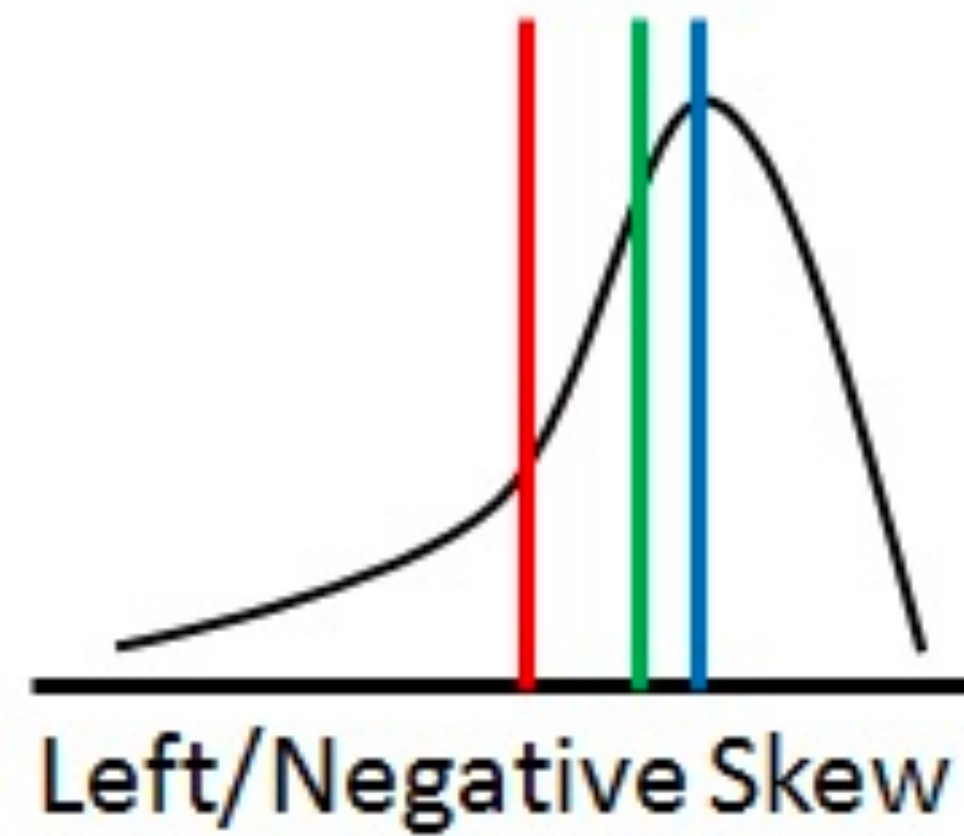
Average

$$\frac{X_1 + X_2 + X_3 + \dots + \dots + \dots + X_n}{n}$$

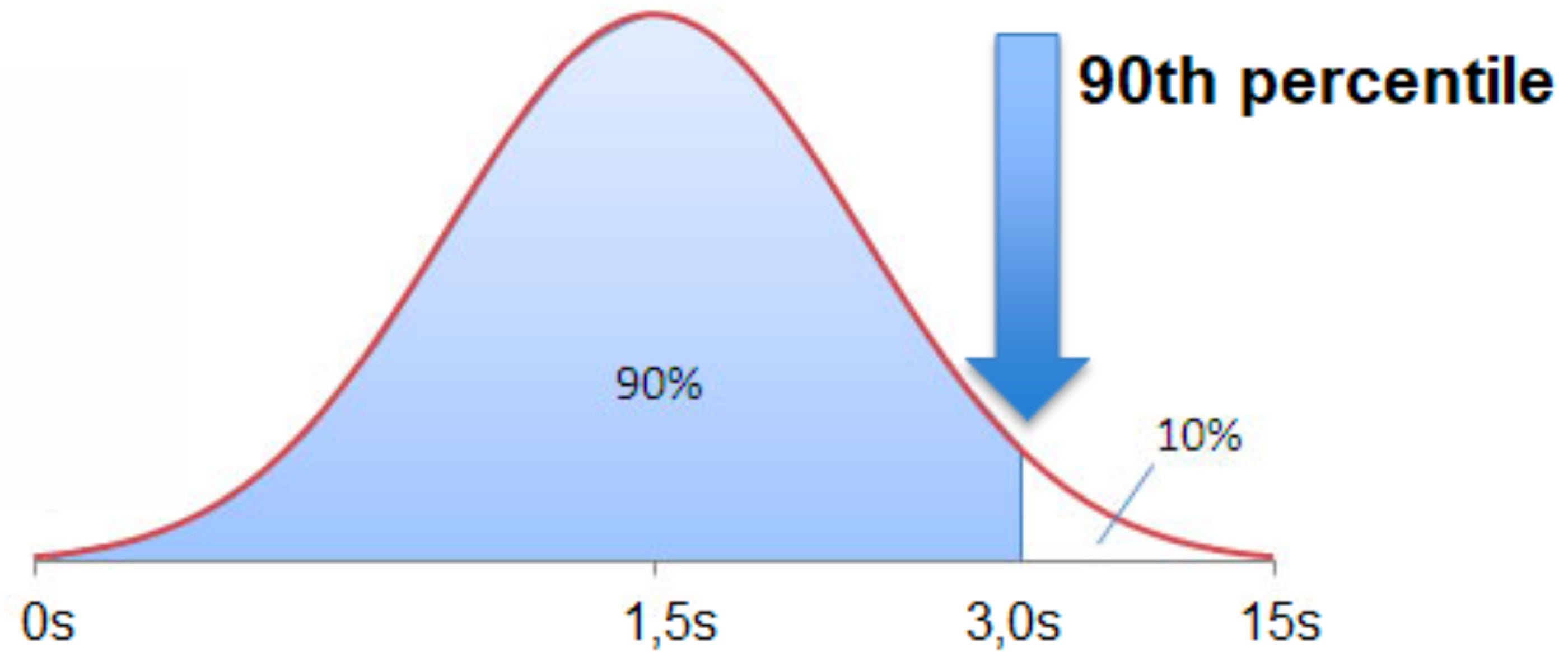
Mean, mode, median



Mode
Median
Mean

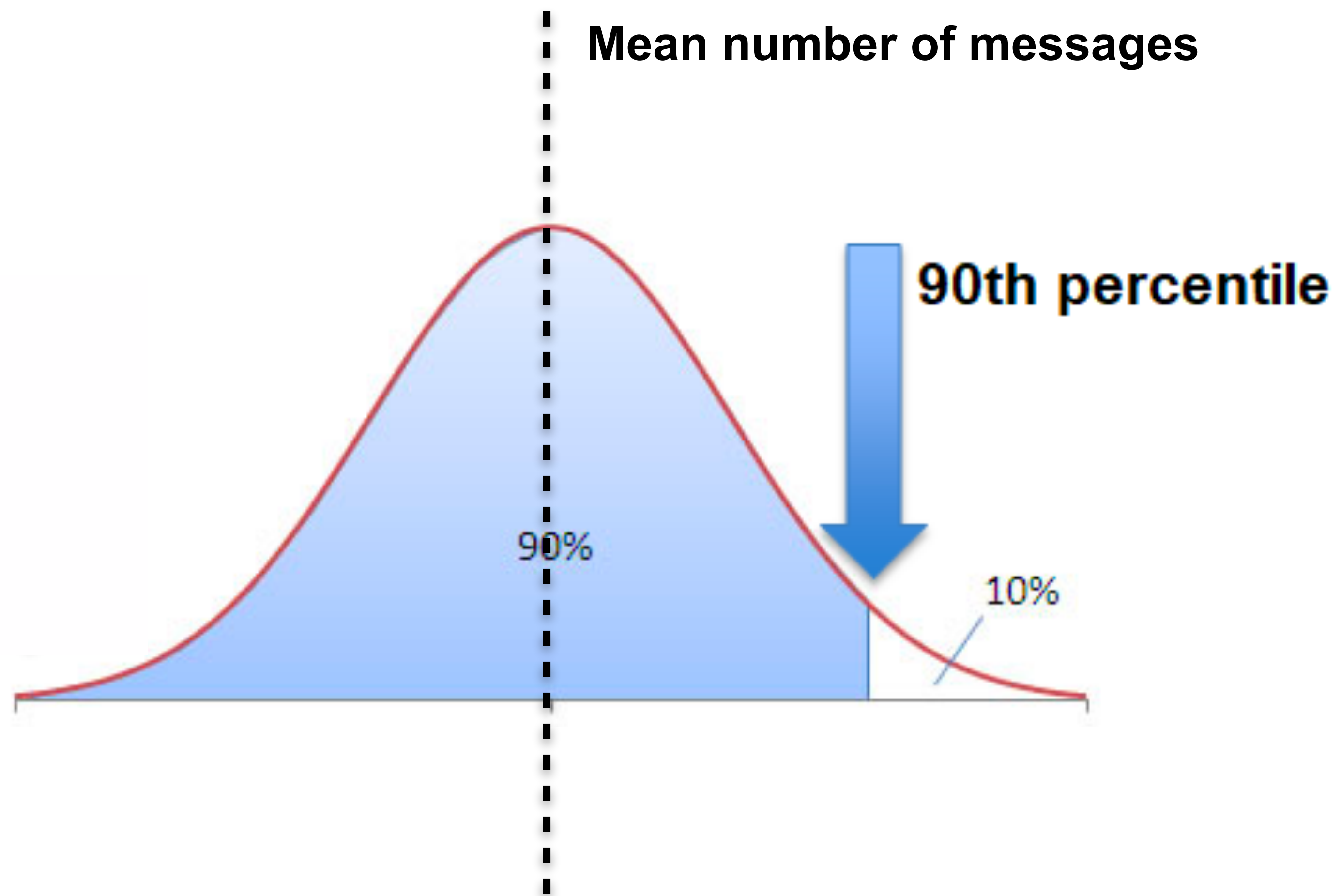


Percentiles



1 What is your distribution like?

2 How this info will be used?



**Average of your data set
is an estimation
of population's average.
So use stat tests.**

REALLY IMPORTANT

**Wrong answers may harm
more than no answers**

Summary

- 🔥 statistics is fun
- 🔥 use statistics for group **comparison, forecasts, rises&drops, average**
- 🔥 use it wisely

Wanna get the slides? – write me on FB

FB

Anastasia Blazhenova

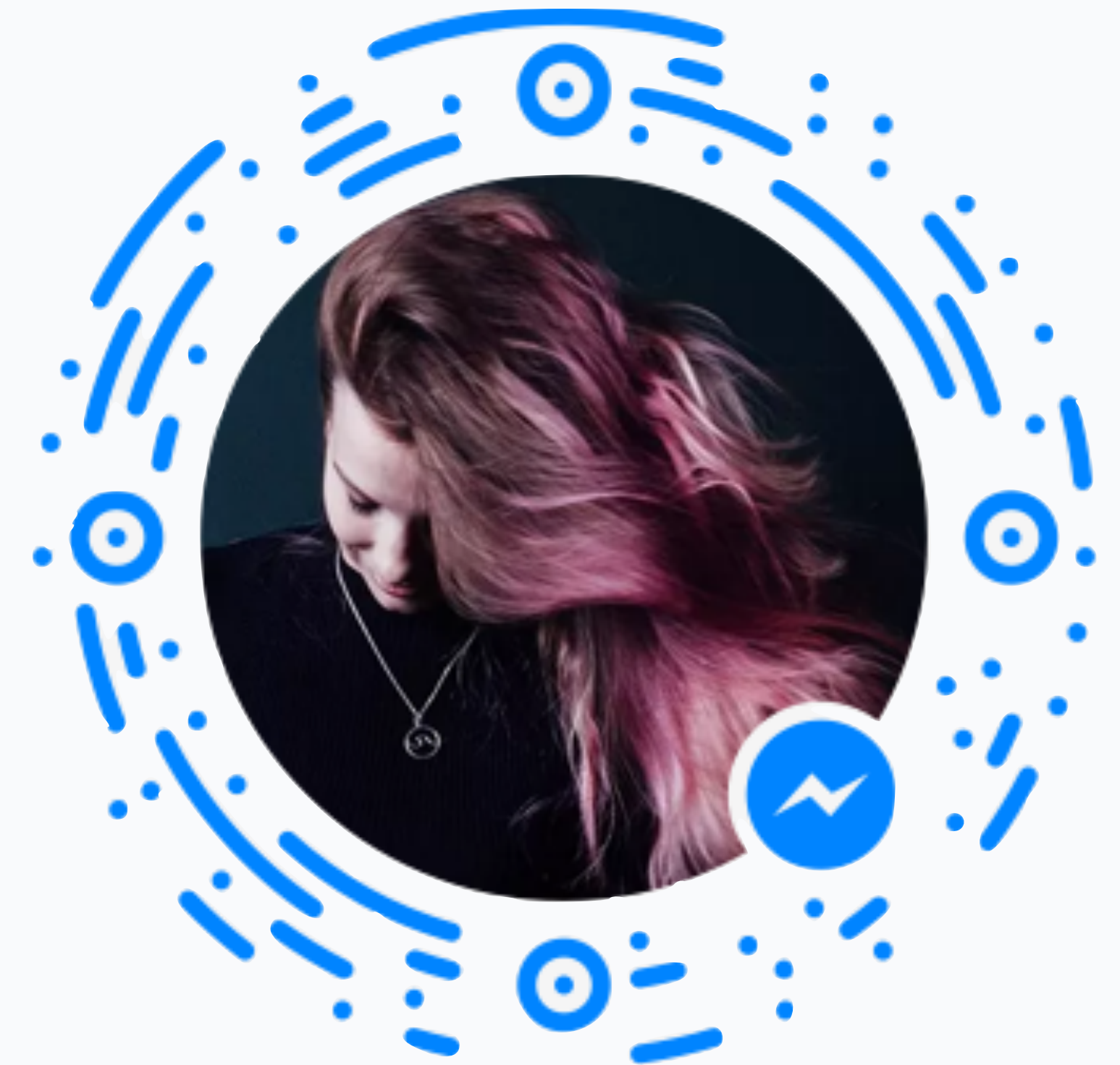
<https://www.facebook.com/anastasia.blazhenova>

LinkedIn

<https://www.linkedin.com/in/anastasia-blazhenova/>

Email

a.blazhenova@gmail.com



Scan from FB Messenger

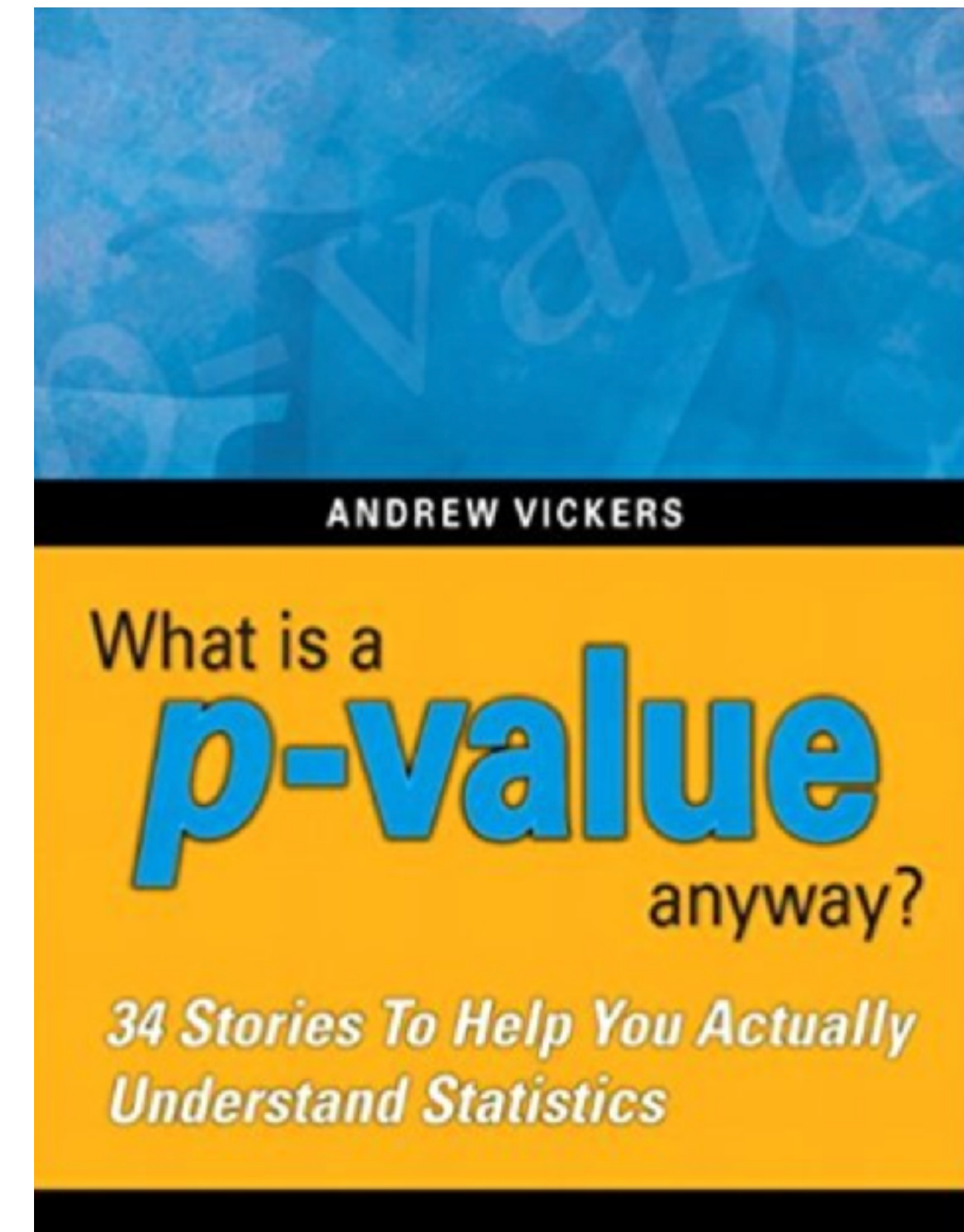
Useful materials

Books

#1

What is a p-value anyway

Book about statistics without a single formula. Explains statistics fundamentals in a very simple way and makes you believe that statistics is not that complicated

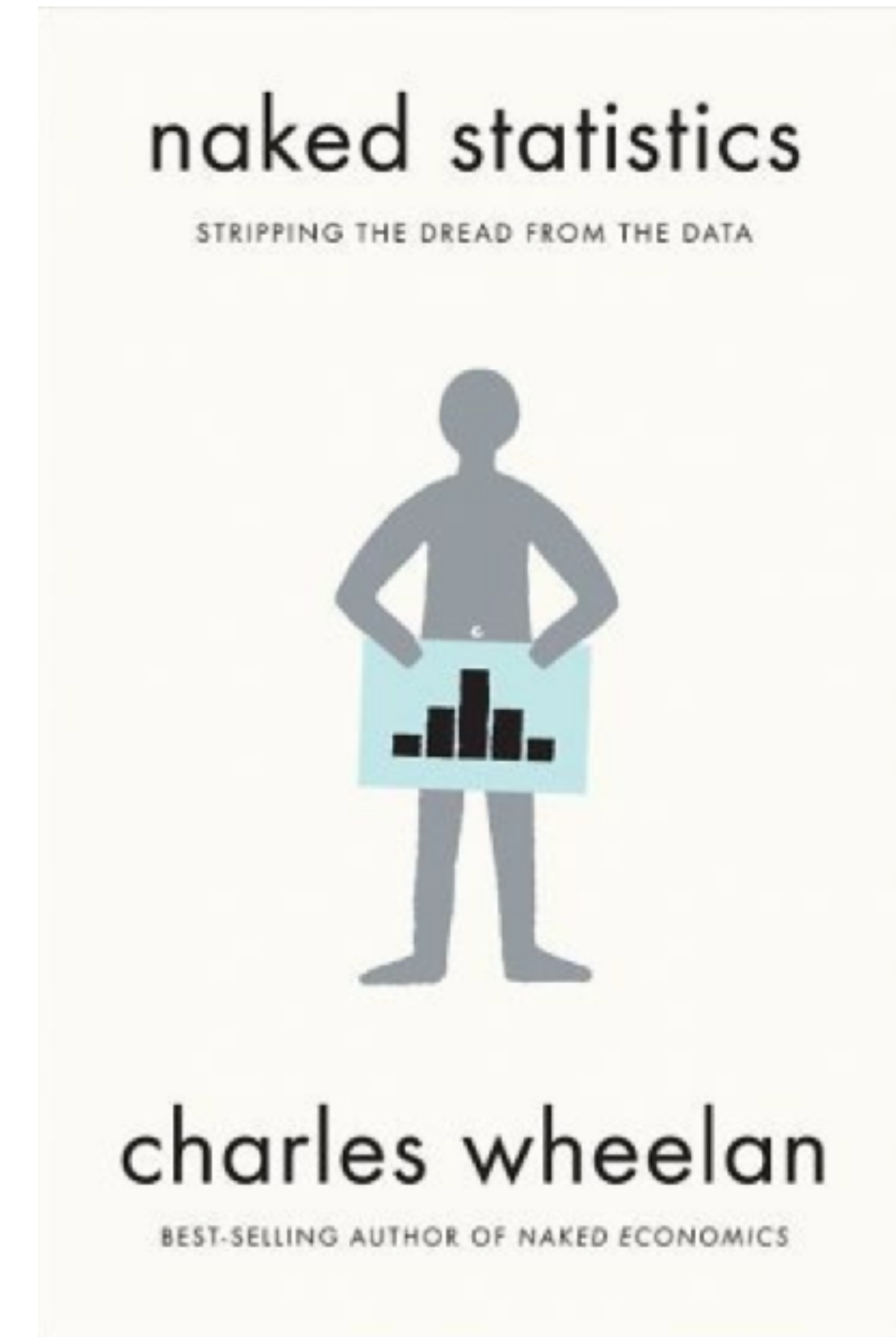


[Buy on Amazon](#)

#2

Naked Statistics

Somewhat more detailed explanations about statistics, still written in a very understandable way. After reading this book what is Central Limit Theorem and why is it a key to all statistician magic



[Buy on Amazon](#)

#3

Statistical Techniques in Business and Economics

This book will help you understand how to use statistics for making business decisions. The book starts with concepts as easy as proportions and painlessly moves to much more complicated subjects as distributions and statistical tests. Every chapter contains examples from business life. Very easy to understand.

Wish I knew about it as I was in university



[Buy on Amazon](#)

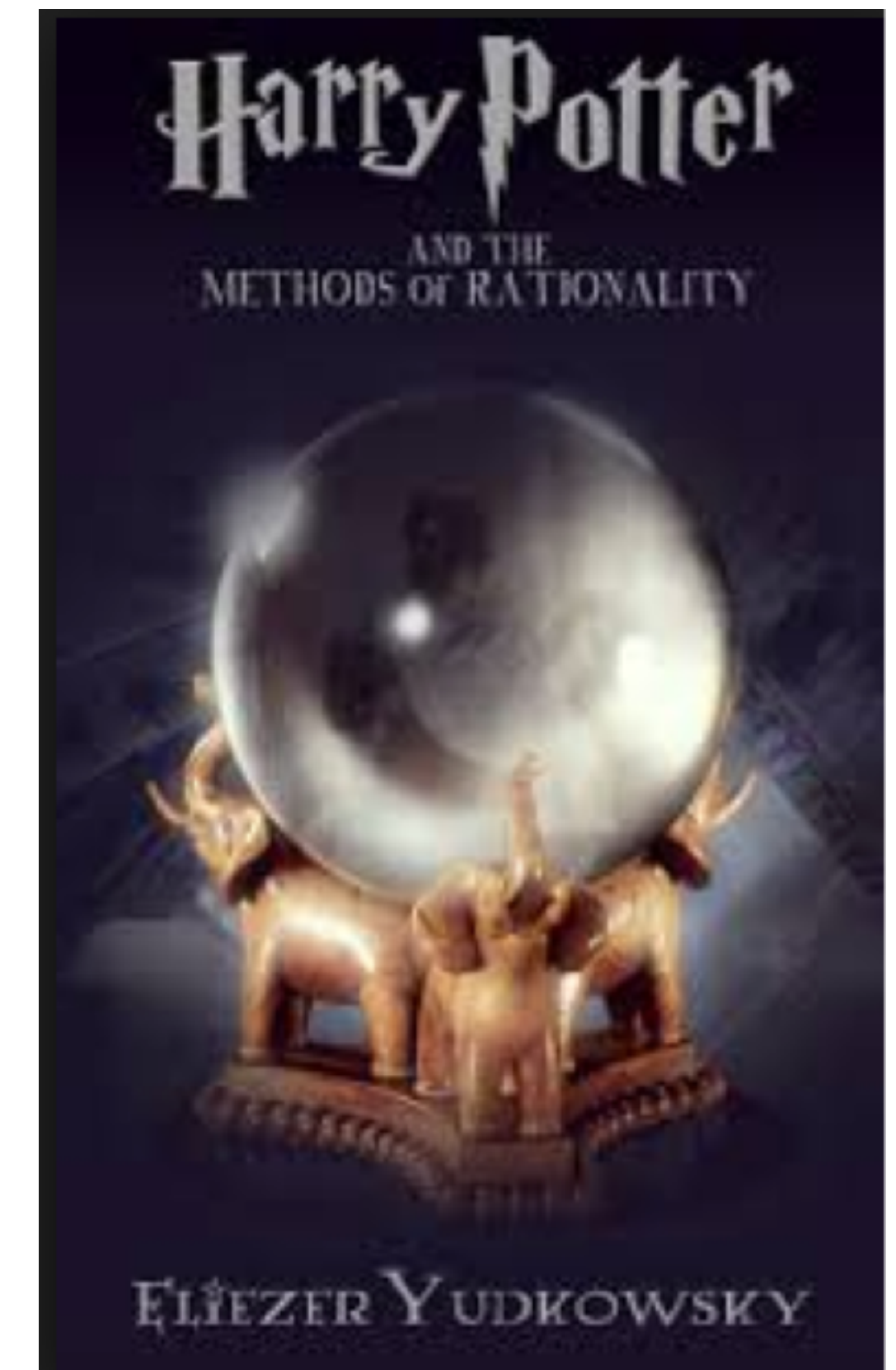
#4

Thinking, fast and slow Harry Potter and Methods of Rationality

Two books not about statistics but about decision making which would help you to understand and prevent your mental biases. For business this skill is not less, and maybe even more important than statistics.



[Buy on Amazon](#)

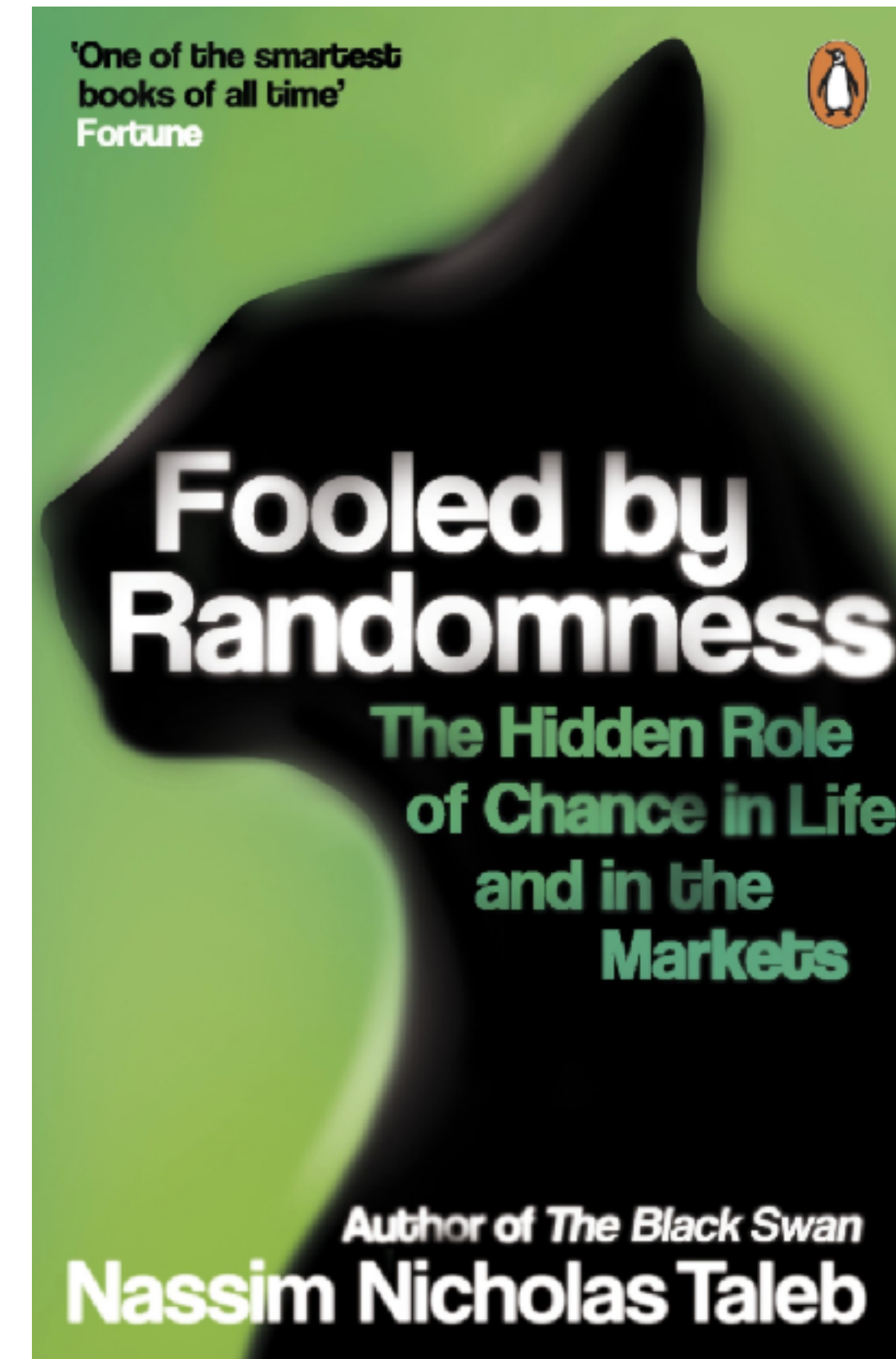


[Read](#)

#5

Fooled by Randomness

Another book about making decisions: will teach you how to separate important things from noise

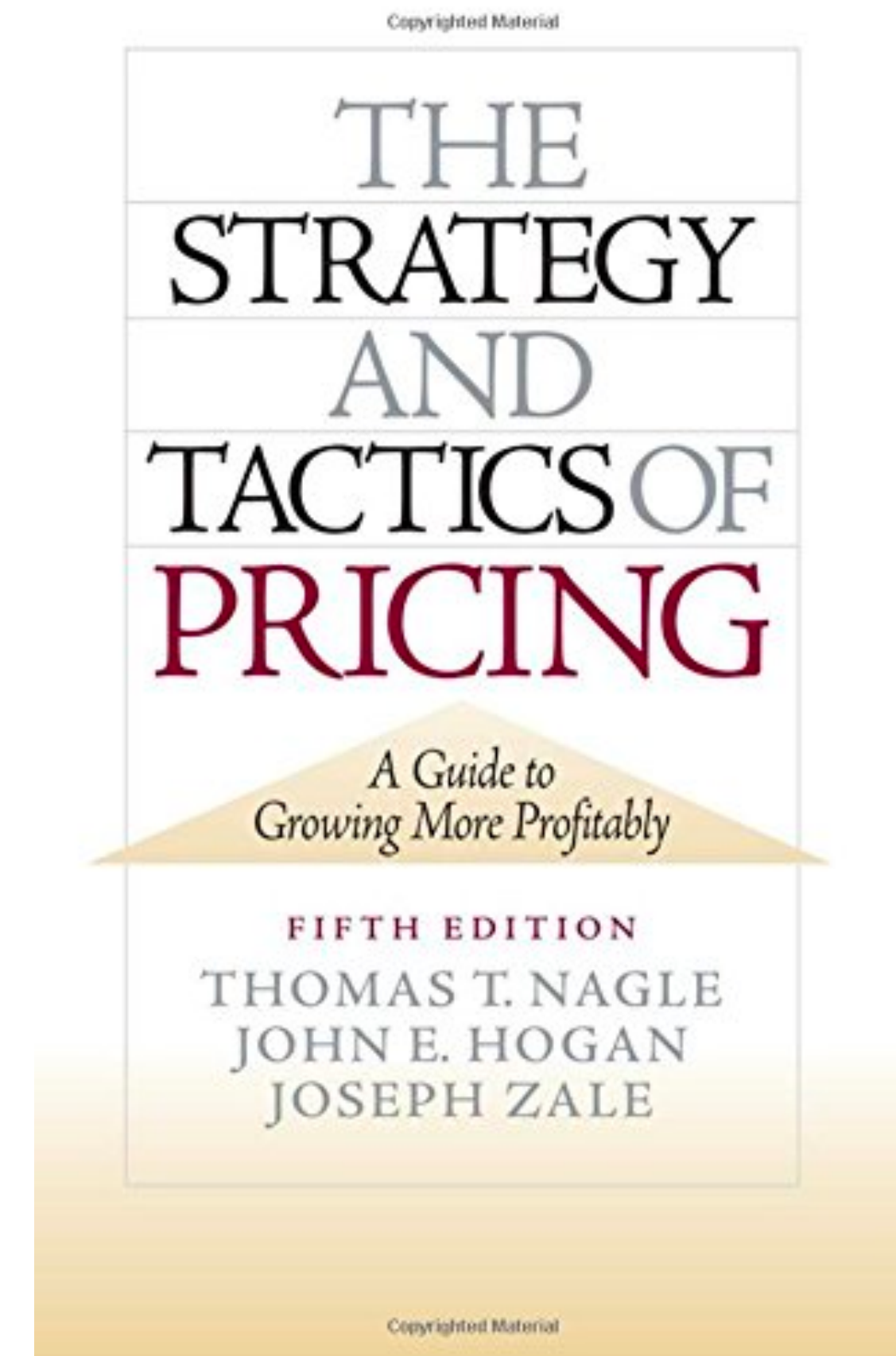


[Buy on Amazon](#)

#6

The Strategy and Tactics of Pricing: A Guide to Growing More Profitably

My favourite book on finding the right pricing strategy for your company



[Buy on Amazon](#)

Useful materials
MOOCs and software

#1

Excel

Excel has a lot of unknown functionality which might help you both with statistics and financial models:
vce all basic statistics tests, sensitivity analysis,
input values analysis, etc

Contras: not all test can be cutomized, Excel is impossible to use for real big amount of data



#2

Xlstat

Very cheap Excel add-on for statistics. Great tutorials, best technical support ever, nice interface. Includes all stat tests, machine learning, clastarization algorithms. My favs ❤️

Contras: need a long time to run on big files



[Visit website](#)

#3

Crystal Ball by Oracle

Excel Add-on for the Monte Carlo Method The only adequate solution I have found.

14 days of free trial help you to understand whether you need the tool. Price is about \$1000 per computer

The Oracle logo, featuring the word "ORACLE" in a bold, red, sans-serif font. A small registered trademark symbol (®) is located at the end of the word.

CRYSTAL BALL

[Visit webiste](#)

#5

Python

When you understand that the date you have exceed what Excel can handle, try Python.

You can automate all the things you do now in Excel and save hours and hours.

Can recommend good starter course on EdX - will take about 1-2 month to get real good results



[Курс на EdX](#)