

Matematika dan Masa Depan

Budi Rudianto
Jurusan Matematika FMIPA
Universitas Andalas

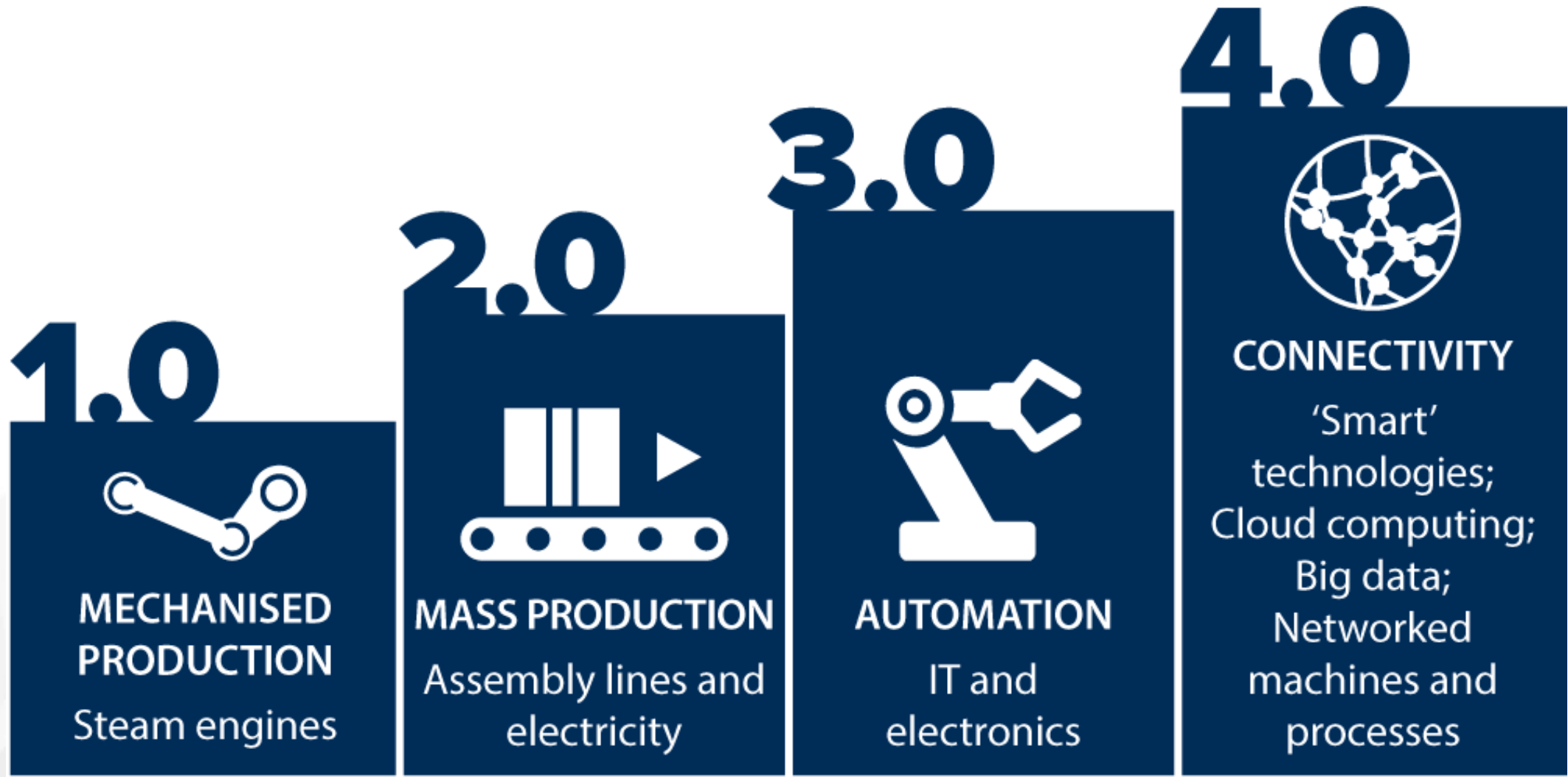




INDUSTRY 4.0



The Fourth Industrial Revolution



The stages of industrial development

Source: Oxford Analytica



Fase periode **Revolusi Industri** membutuhkan masa yang semakin singkat dari waktu ke waktu

Ekonomi Dunia



Sharing economy



e-Education



e-Government



Cloud Collaborative



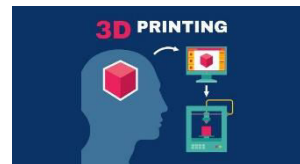
Marketplace



Online Health Services



Smart Manufacturing



Smart City



Smart Appliances

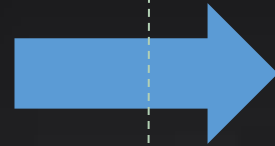


ini berbagai macam kebutuhan yang sudah banyak menerapkan dengan internet dan dunia digital sebagai wahana transaksi dan transaksi

Beberapa Transformasi di Indonesia



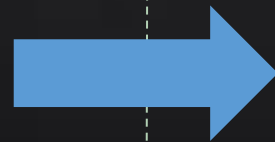
Toko Fisik



Market Place Online



*Ojek dan Taksi
Konvensional*



GO-Jek, Grab, dll

REVOLUSI INDUSTRI 4.0

OPPORTUNITIES

THREATS



KETERAMPILAN YANG DIBUTUHKAN 2020

2015

1. Complex Problem Solving
2. Coordinating with Others
3. People Management
4. **Critical Thinking**
5. Negotiation
6. Quality Control
7. Service Orientation
8. Judgement and Decision Making
9. Active Listening
10. **Creativity**

2020

1. Complex Problem Solving
2. **Critical Thinking**
3. **Creativity**
4. People Management
5. Coordinating with Others
6. Emotional Intelligence
7. Judgement and Decision Making
8. Service Orientation
9. Negotiation
10. Cognitive Flexibility

INNOVATORS' COMPASS

BIG PICTURE

Define
PRINCIPLES

What matters most? Why?

Dream
IDEAS

What could happen?

See the **PAST & PRESENT**
in new ways

Center on
PEOPLE

See the **FUTURE**
in new ways

Discover
OBSERVATIONS

What's happening? Why?

Design
EXPERIMENTS

What's a way to try?

DETAILS

Strategi Menghadapi Era Digital

Bagaimana Merespon Masa Depan



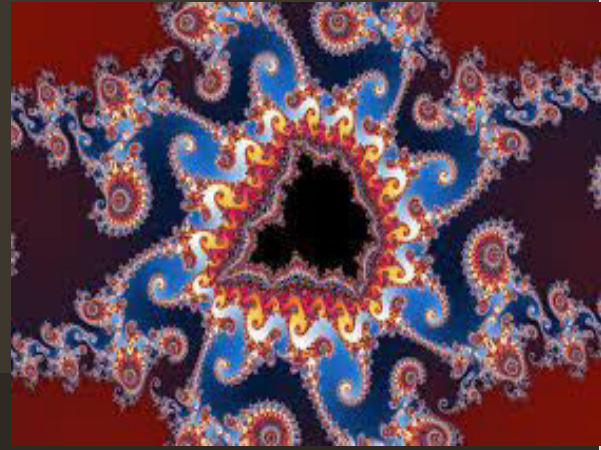


www.shutterstock.com - 358539427

**MATHEMATICS
IS *NOT* ABOUT
NUMBERS OR
EQUATIONS.
IT IS ABOUT IDEAS
AND HOW WE
UNDERSTAND THEM.**



www.shutterstock.com - 361567649

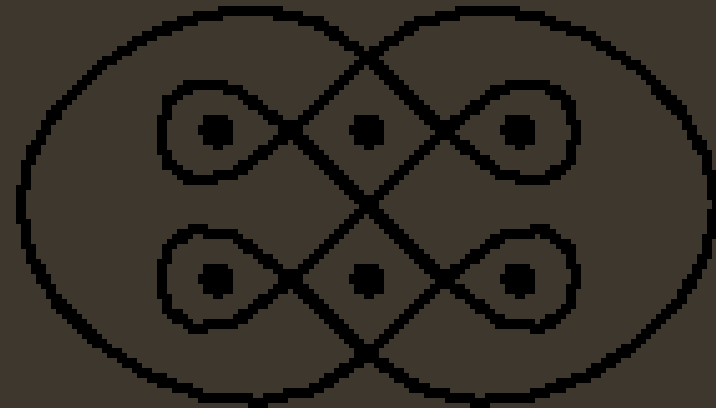
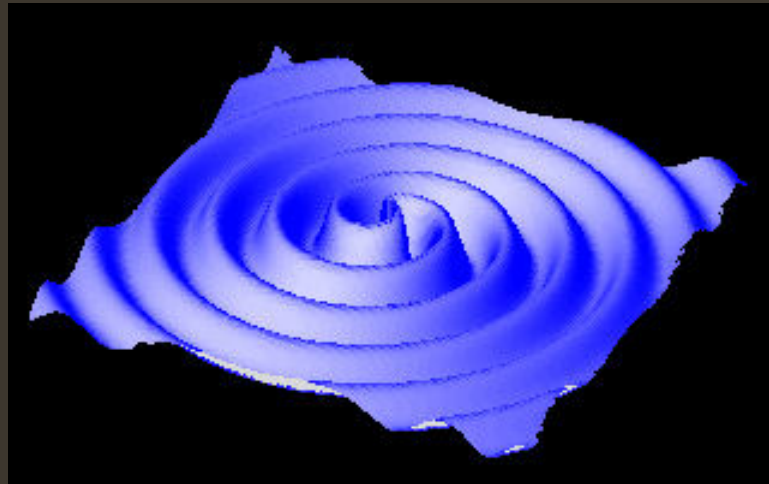


The truth is rather different!

The modern world would not exist without maths

With maths you can tell the future and save lives

Maths lives at the heart of art and music



Penerapan Matematika

Google : Linear algebra, graph theory, SVD



Internet : Network theory

Security : Fermat, RSA

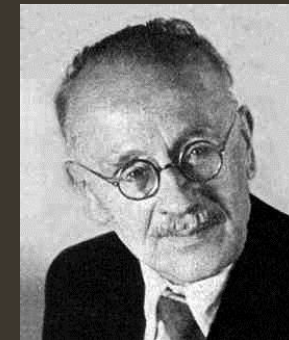


Error correcting codes : Galois theory

Medical imaging : Radon Transform

Communications : FFT, Shannon

Medical Statistics : Nightingale



Matematikawan telah mengubah dunia menjadi mudah

Kunci memasuki dunia modern adalah Informasi



Berdasarkan analisis dari laman berjejaring LinkedIn, pada 2019 perusahaan cenderung mencari kandidat yang menguasai *kombinasi dari hard skill dan soft skill*, dengan kreativitas berada di posisi pertama dalam daftar keterampilan yang dibutuhkan oleh perusahaan.

Artikel ini telah tayang di [Kompas.com](https://ekonomi.kompas.com/read/2019/01/21/073700826/inilah-10-skill-yang-paling-dibutuhkan-perusahaan-tahun-2019) dengan judul "Inilah 10 "Skill" yang Paling Dibutuhkan Perusahaan Tahun 2019",
<https://ekonomi.kompas.com/read/2019/01/21/073700826/inilah-10-skill-yang-paling-dibutuhkan-perusahaan-tahun-2019>.
Penulis : Mutia Fauzia
Editor : Erlangga Djumena

Soft Skill


1. Kreativitas
2. Persuasif
3. Kolaborasi
4. Kemampuan beradaptasi
5. Manajemen waktu

Hard Skill

1. Komputasi cloud
2. Kecerdasan buatan
3. Analytical reasoning
4. Manajemen manusia
5. UX design

The logo consists of a white cloud shape containing the lowercase letters "esds" in a simple, sans-serif font.

esds

A person in a dark suit is shown from the chest up, with their hands held out in front of them. From the palms, a glowing blue light emanates, and a series of digital icons are projected upwards. At the top is a large, central cloud icon. Below it are several smaller cloud icons, each connected by thin lines to a cluster of smaller icons representing various computing services like servers, databases, and networks. The background is dark, making the glowing elements stand out.

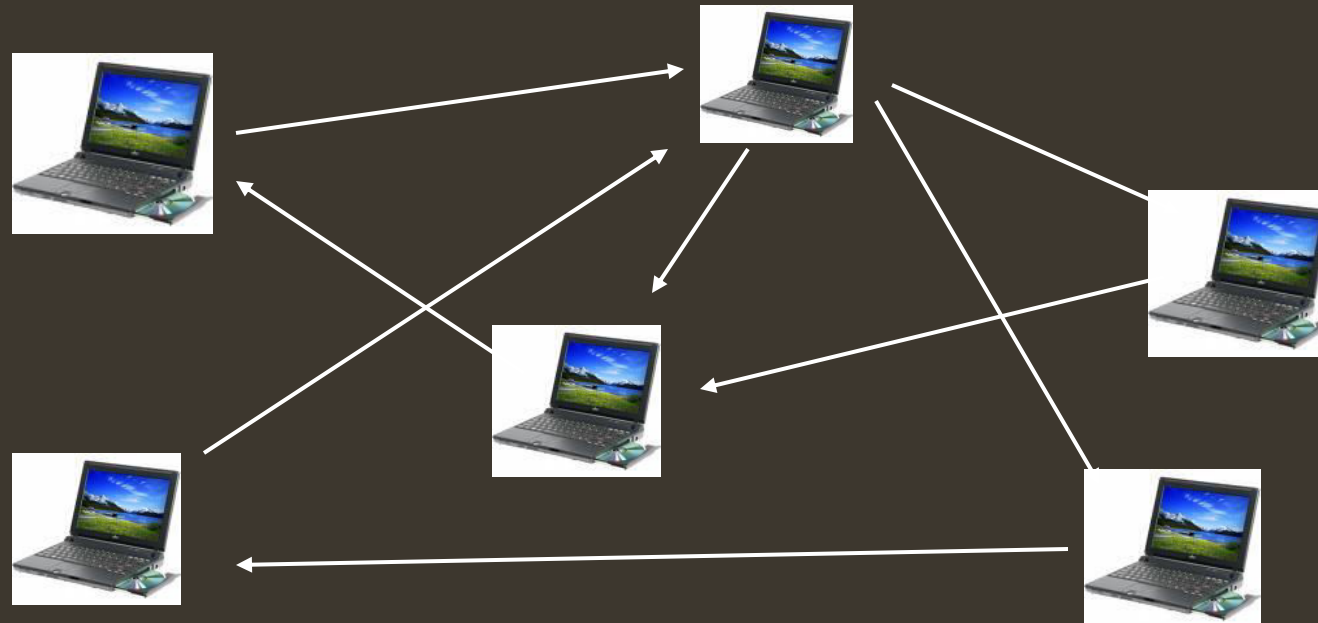
Cloud Computing

The Maths Behind Google

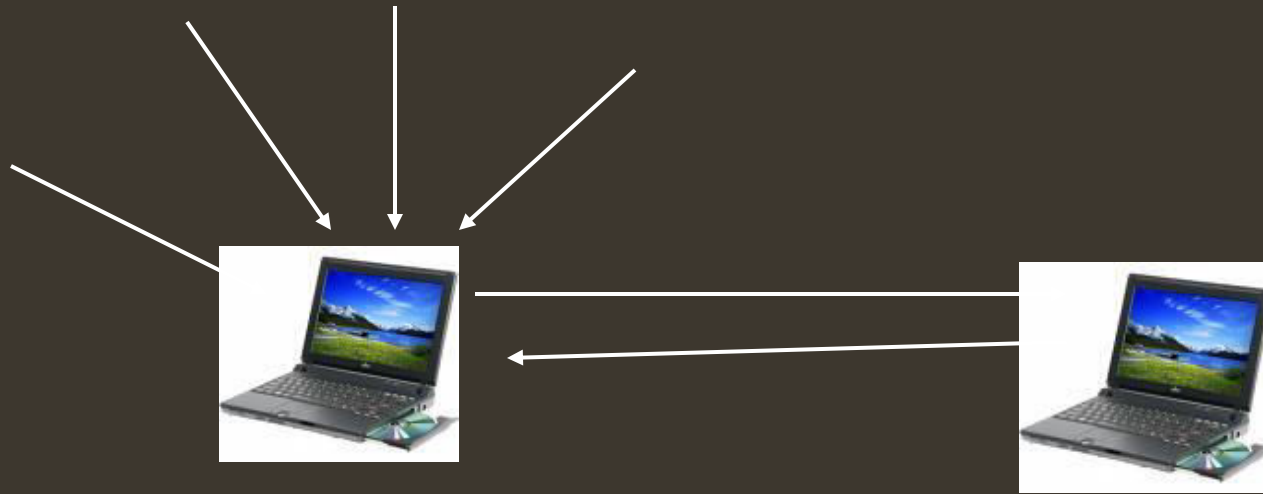


Google searches for **information** stored on many **web-sites**

Web-sites are linked together by a **network** showing which web-site points to which other web-site



It **RANKS** web-sites in order of the importance of the information that they contain.



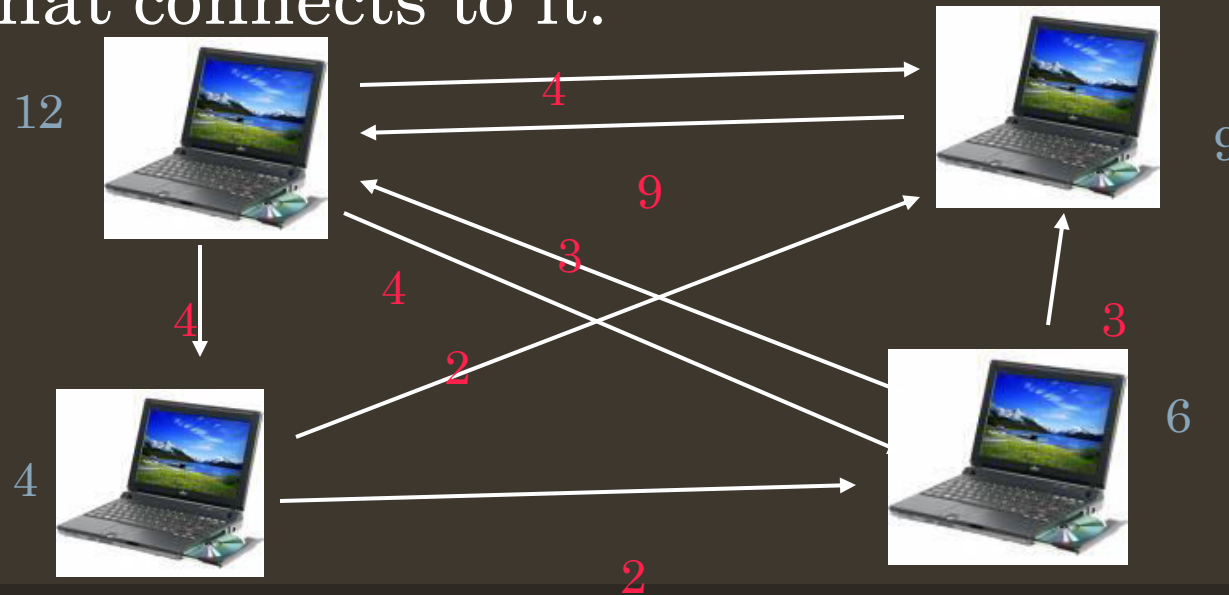
IDEA. A website is important if **lots of other** websites link to it.

PAGE RANK

Each Web-site has a rank R

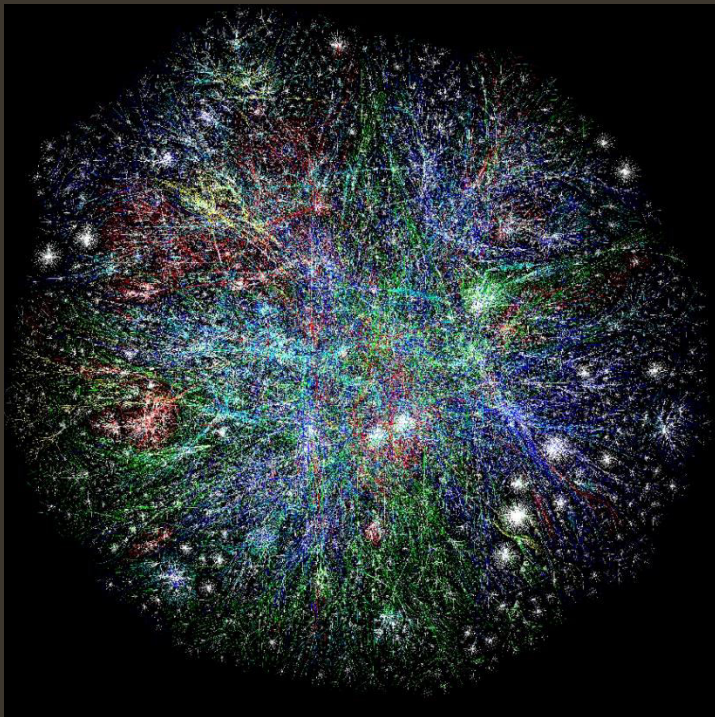
Divide R by the number N of web-sites that this web-site links, to get $S=R/N$

For each web-site, calculate R by adding up the values of S for every web-site that connects to it.



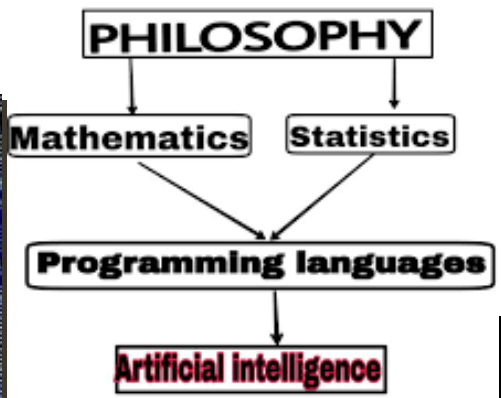
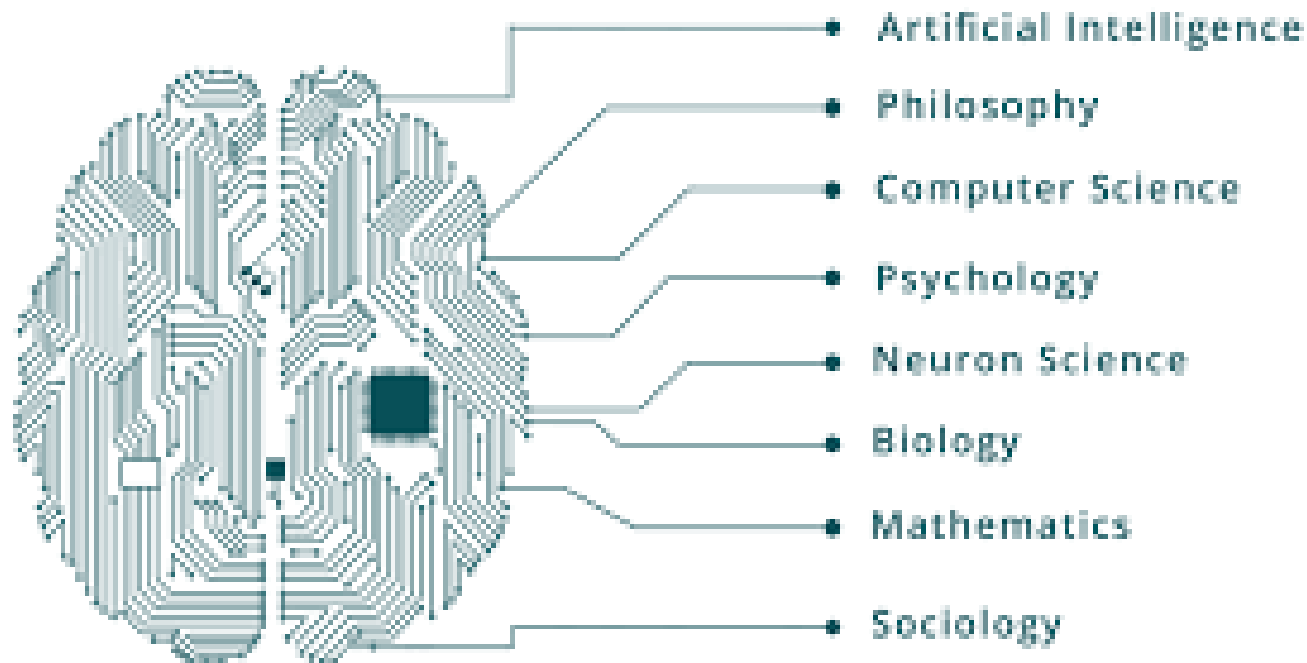
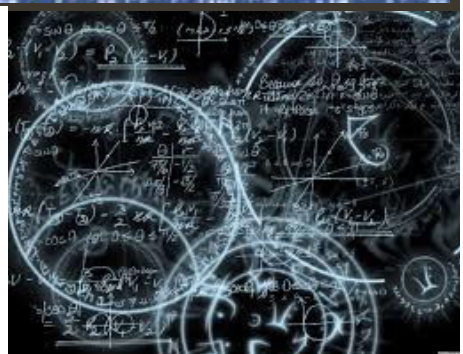
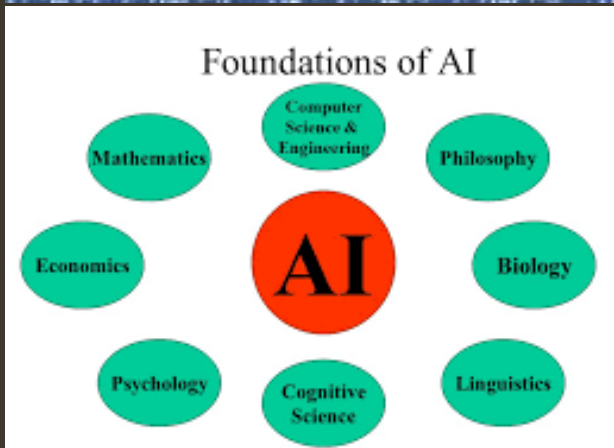
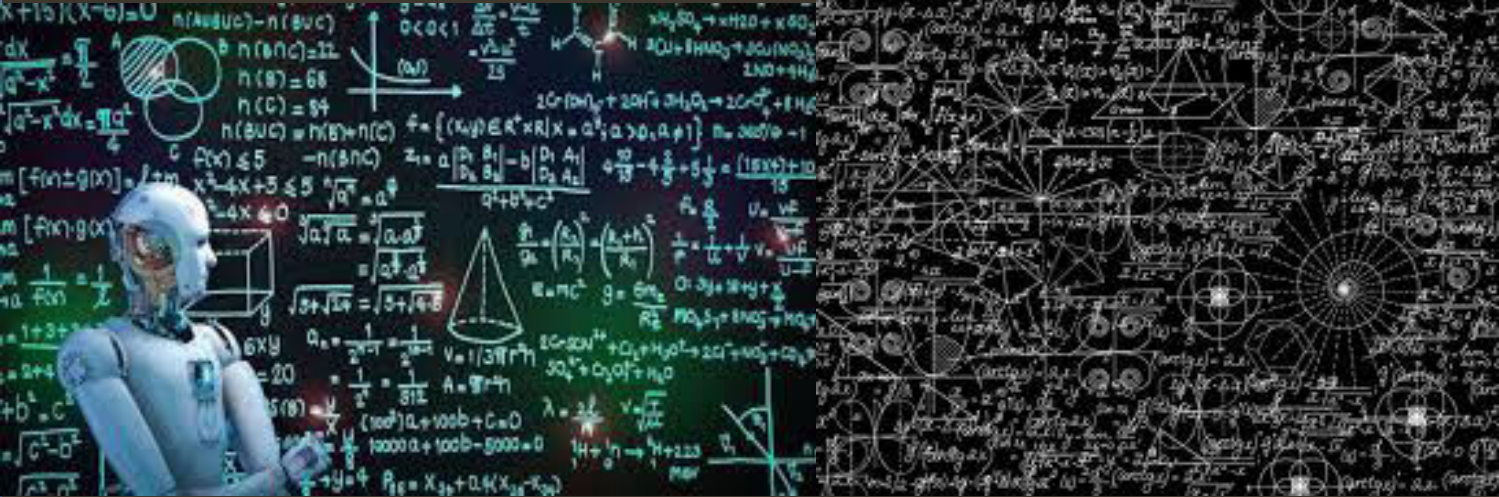
Now do the same for 1 000 000 0000 more computers

Need to calculate the unit eigenvector of an extremely large matrix!



ARTIFICIAL INTELLIGENCE





@Cyphert

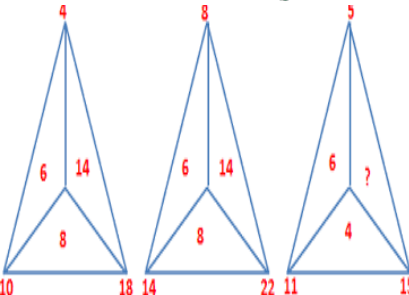


ANALYTICAL REASONING

Choose the image that completes the pattern.



Next Question



3	141592653589793238462643383
27	582801971696935510582097494
59	2607816406286208990628034825342
71	079821480865132823566470938446095
50	9217753591081148117
45	2840701938211655944
67	2489949303019478009
75	6899334612475482
33	787838652120109
1	56489692460386
10	54326482339307
20	2491127245800
66	83155881748152020962829
25	91715064878925036001305
30	98204052134146919941109
43	05727036759619530921661138
19	26117931851184807446237952
74	5673518575274891227081
83	0140912986673012
	440566430



HUMAN RESOURCES MANAGEMENT



Average performance of 15-year-olds on international maths and science tests

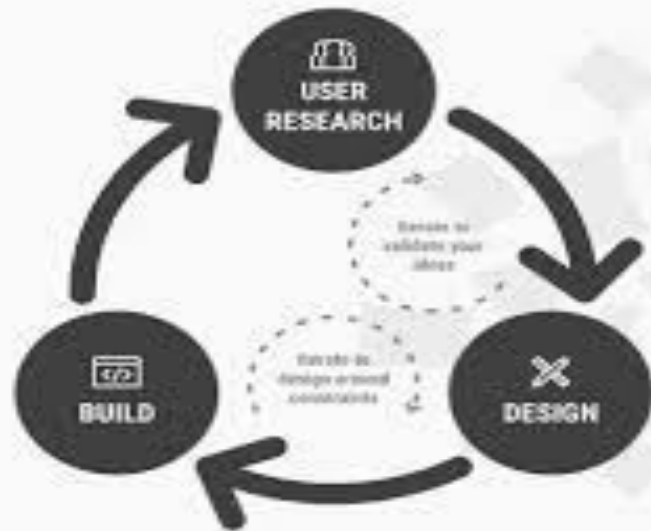
OECD average in 2000=500



Source: Programme for International Student Assessment (PISA) and Trends in International Mathematics and Science Study (TIMSS), placed on the PISA scale by the OECD, 2015

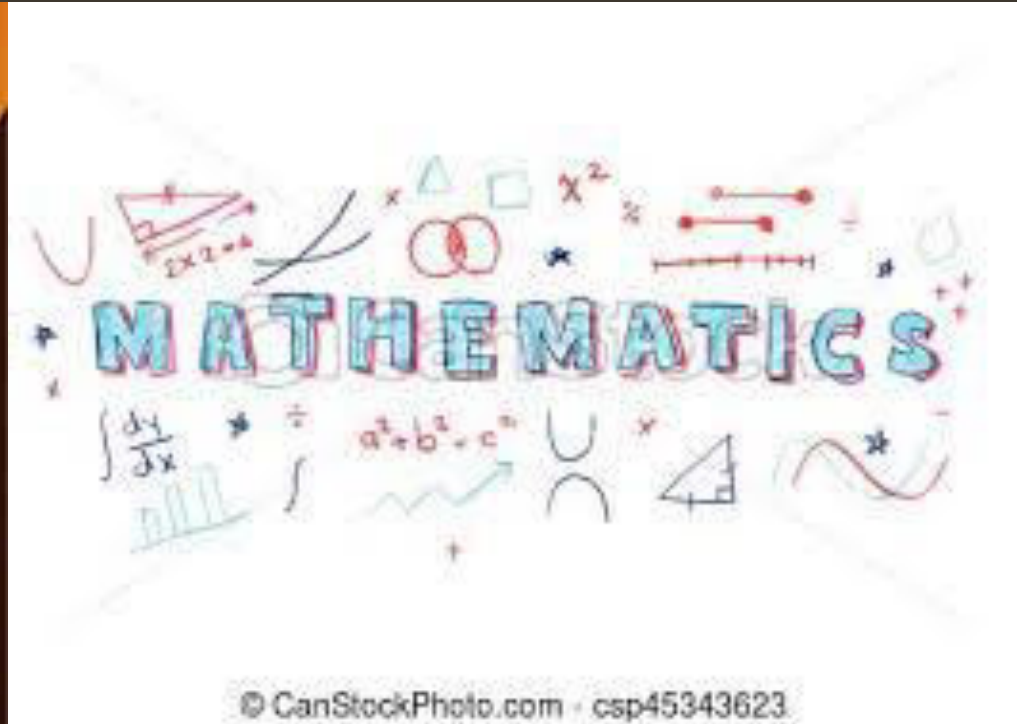


THE ITERATIVE PROCESS OF UX DESIGN



UNIVERSITY OF TORONTO
POLYVALENT

BY INTERACTION-DESIGN.ORG



© CanStockPhoto.com · csp45343623

