



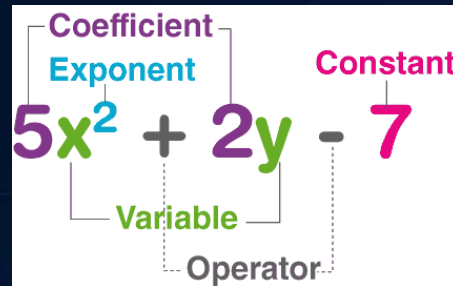
*Prof. Nitin Saxena*  
*Dept. of CSE*

## *Digital Security*

*The most promising career choice  
for Engineering Aspirants*

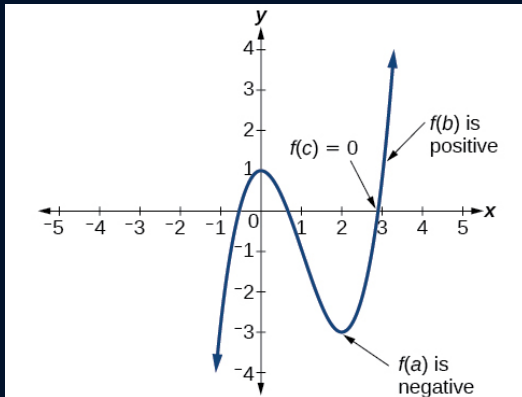


# Basic JEE Math



## Primes

- ❖ What are prime numbers?
- ❖ How to find them?



## Roots/ Zeros

- ❖ Roots of a polynomial?
- ❖ How to find them?

## Polynomials

- ❖ What are polynomials?
- ❖ How to store them?

$$\begin{bmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \end{bmatrix} \times \begin{bmatrix} 7 & 8 \\ 9 & 10 \\ 11 & 12 \end{bmatrix} = \begin{bmatrix} 58 & 64 \end{bmatrix}$$

## Matrices

- ❖ How to store them?
- ❖ What do they mean?

*How do these help in the digital world?*

- ❖ Does abstract thinking have real applications?

# Industry Impacts



## Healthcare

*Robust cybersecurity crucial for protecting patient data, Ensuring care continuity*



## Vehicular Communication

*Self-driving vehicles highly vulnerable, requiring advanced cybersecurity for safe navigation*



## Banking

*Banks investing heavily in cybersecurity to secure sensitive financial transactions*



## Manufacturing

*Manufacturers must guard against cyber threats, software vulnerability, info theft*



## Law Enforcement

*Increasing reliance on cybersecurity experts to tackle growing cyber threats*



## Online Retailing

*Firewall, antivirus software, expert guidance essential for detecting online threats*



# Rising Need

\$550M  $\xrightarrow{2x}$  \$1.1B  
2022 2023

Ransomware Payments made Globally

3.5 Million  $\uparrow$

In Global security workforce by 2025

By 2050



Smart homes with significantly higher weak access points (smart devices)

In a hyperconnected world, cybercriminal threats only multiply

**UK Electoral Commission hack exposed data of 40 million voters**

TIMESOFINDIA.COM / Aug 9, 2023, 18:09 IST

  
THE TIMES OF INDIA

**Russian Ransomware Group Breached Federal Agencies in Cyberattack**

The New York Times

**Marriott Hotels fined £18.4m for data breach that hit millions**

30 October 2020

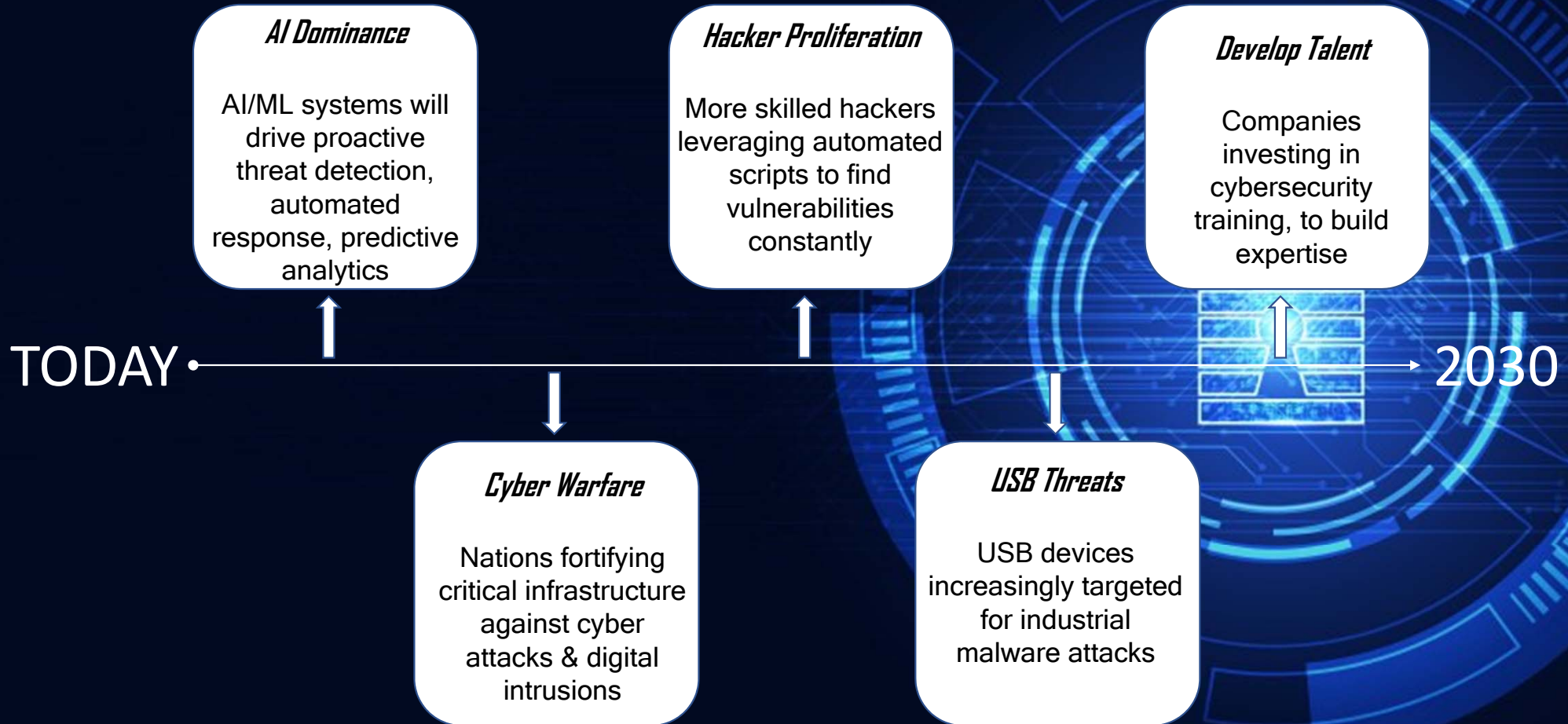
BBC

**Thousands of Microsoft Customers May Have Been Victims of Hack Tied to China**

The New York Times



# Imagining 2030



# Skills & Career Opportunities



*Security Analyst*



*Security Engineer*



*Chief Information Security Officer*



*Security Consultant*



*Cryptographer*



*Security Architect*



# Global Job Prospects



## *Increased Upper Management Positions*

By 2026, 70% of boards will include one member with cybersecurity expertise

## *Higher Expenditure on Cybersecurity*

60% of firms find it difficult to recruit Cybersecurity talent  
50%+ have difficulty retaining them

Average Cybersecurity salary sits at \$240K  
Wage inflation + Worker shortage should help boost this figure

## *Rising Demand for Specialized Skills*

Demand for application and cloud security skills will grow by 164% and 115% in the next five years

## *Blended Roles and Responsibilities*

Shift left principles involve developers in early cybersecurity measures, enhancing security

## *Takeaway Focus*

*Advanced Biometrics*

*Increased Ransomware Threats*

*Improved supply chain security*

*Safeguard remote access & USB*

*Strong Cybersecurity Skills*

*Role of AI*

*Curb large scale malicious actors*

*Decreasing Data Breaches*

*Better State of Passwords*



# Trends & Impact

## AI/ML Dominate Defense

AI/ML systems proactively detect threats, enable real-time defense



## 5G & Edge Computing

5G and edge computing introduce new vulnerabilities to address



## Quantum Computing Threats

QC threatens current encryption, requiring quantum-resistant cryptography



## Cyber-Physical Attacks

Critical infrastructure faces rising cyber-physical attacks from adversaries



## IoT Priority

IoT proliferation increases attack surfaces, demanding robust IoT security

Cybersecurity becomes enterprise-wide strategic priority in complex digital landscape



# IIT Kanpur Incubated Startups



*In the Cybersecurity Space*



# India's Startup Boom



**SEQUIRETEK**  
READY TO SECURE™

Comprehensive cybersecurity solutions for businesses

\$8M - Series A  
2023

250+ employees



Com Olho

Real time threat detection and responses using AI/ML

\$200K - Seed Funding  
2022

20+ employees



Cloud Security for protecting vital information

\$7M - Series A  
2022

100+ employees



SECURE THINGS

ML based cybersecurity for connected vehicles

\$3.5M - Pre-Series A  
2022

25+ employees



Unified Network Security Gateway

AI powered unified network management for enterprises CySe

\$22M - Seed valuation  
2022

100+ employees

## Indian Cybersecurity Space



Protector IQ

Cyberxtron Technologies

FORENSIC CYBERTECH



*Thank you*

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