BAHRAIN TEACHERS COLLEGE
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Al-Khwarizmi

Father of algebra

History of mathematics

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Section 4

General information

- **Full Name : Abu Ja'far Muhammad ibn Musa Al-Khwarizmi**
- **Born: about 780 in Khwarezm (now in Iran).**
- **Died: about 850**
- **Called : 'father of algebra'**

He was :

- mathematician
- astronomer
- geographer
- historian

Al-Khwarizmi

Contribution

1. Algebra : a mathematical text he published in about 830 called **"Al-Kitab al-mukhtasar fi hisab al-jabr wa'l-muqabala".**

was contain 3 Parts :

- **First part:** discusses the equations of the first and second degrees.
- **Second part:** Deals with practical mensuration by giving rules for finding the area of various plane figures including the circle, and for finding the volume of a number of solids including cones and pyramids.
- **Third part :** concerns legacies as well as inheritance. It consists entirely of solutions to problems which arise out of legacies.

“al-Jabr wa al-Muqabalah” book

contains chapters which cover various topics:

i. Operations of multiplication, addition, subtraction and division.

ii) Equations
iii) Survey
iv) Problems in sale and purchase and commercial transactions
v) Division/Distribution of currency
vi) Weights and Measures
vii) Measurement of a flat plane
viii) Surface area of circle and triangle
ix) Volume of pyramid and cone
x) Wills and inheritance property distribution

thousands	hundreds	tens	Ones
1	2	3	4
+ 2	3	4	5
3	5	7	9

Until NOW

We still use Al-Khwarizmi ways in

+ − × ÷

(الجبر)

algebra

Was referring to

Solving equations of the issues that faces Muslims

- Distribution of property. توزيع الأملاك
- Inheritance. الميراث
- Zakat. الزكاة
- Qibla direction. اتجاه القبلة

الخوارزمي

الخوارزمية

Algorithm

It is mean solving equations using **Al-Khwarizmi way.**

Al-Khwarizmi
Contribution

2. Numeral System:

"Western scholars are of the opinion that zero is one of the greatest mathematical invention or innovations in the world contributed by a Muslim scholar".

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3. Trigonometry:

Al-Khawarizmi was the first person to introduce the theory of jib (sine), tajjib (cosine), dhill (cotangent) and tadhill (tangent)

Al-Khwarizmi
Contribution

3. Geometry:

- the area of triangle.
- the area of parallelogram.
- the area of circle

What did he do?!

Most important contribution to algebra

Ever heard of completing square?

Al-Khwarizmi Method

Let us see the example problem..!

$X^2+10X = 39$

Step 3:-

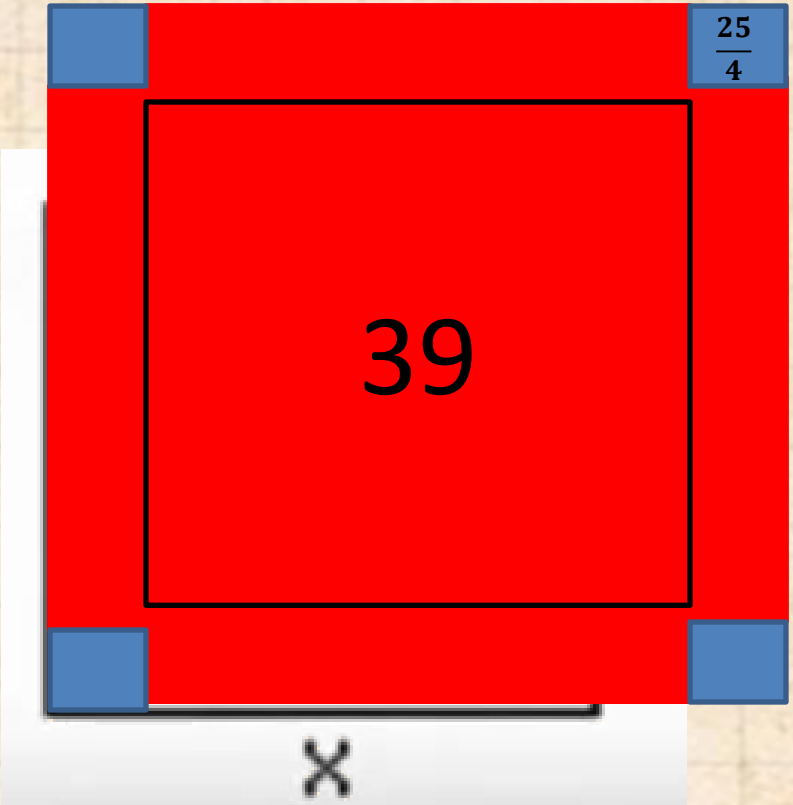
Step 1:-

$39 + 25 = 64$

Each side of large square = 8

Side of original square =

$8 - \frac{5}{2} \cdot 2 = 3$



Step to CTS

$X^2 + 12X + 4 = 0$

STEP 1:

$(X^2+12X+ \text{-------}) \_ \text{------} + 4 = 0$

STEP 2:

(B/2)² , add the answer to B and C

$(X^2+12X+ \text{---}36\text{---}) \_ \text{--}36\text{--} + 4 = 0$

STEP 3:

$(X+6)^2 \_ 32 = 0$

STEP 4:

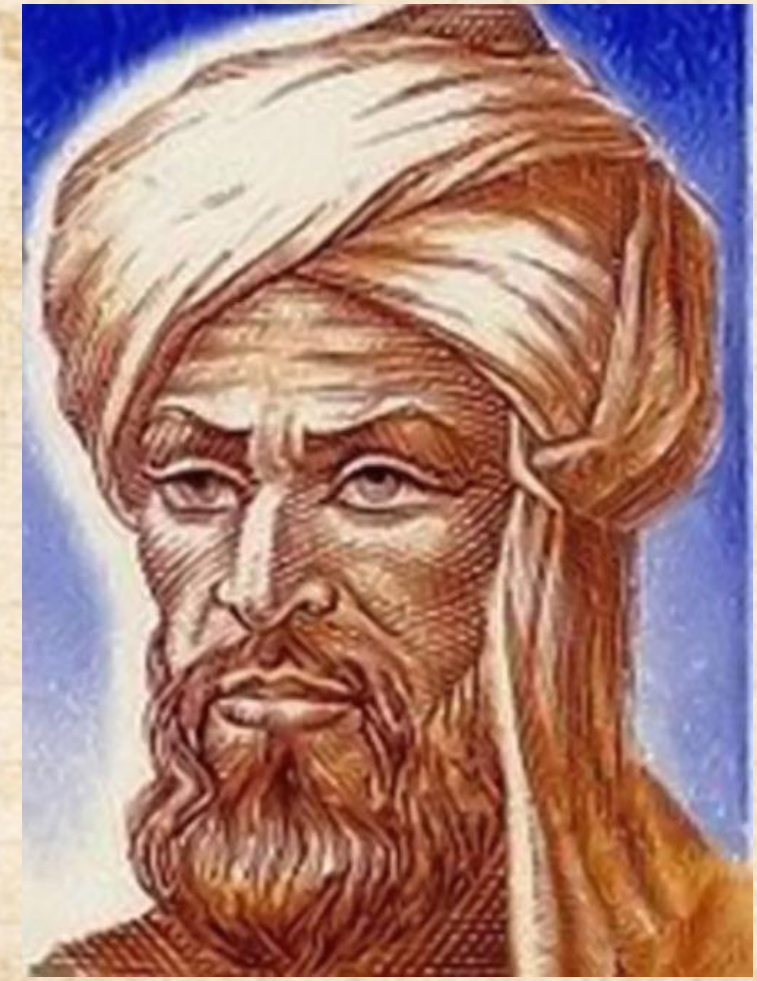
$(X+6)^2 = 32$

STEP 5:

$X+6 = \pm\sqrt{32}$

STEP 6:

$X = -6 \pm \sqrt{32}$ $\qquad$ $X = -6 \pm 4\sqrt{2}$



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