OGUN DIGICLASS

CLASS: SECONDARY SCHOOL

SUBJECT: MATHEMATICS

TOPIC: QUADRATIC EQUATION

SUB-TOPIC: COMPLETING THE SQUARE &

QUADRATIC FORMULA METHODS

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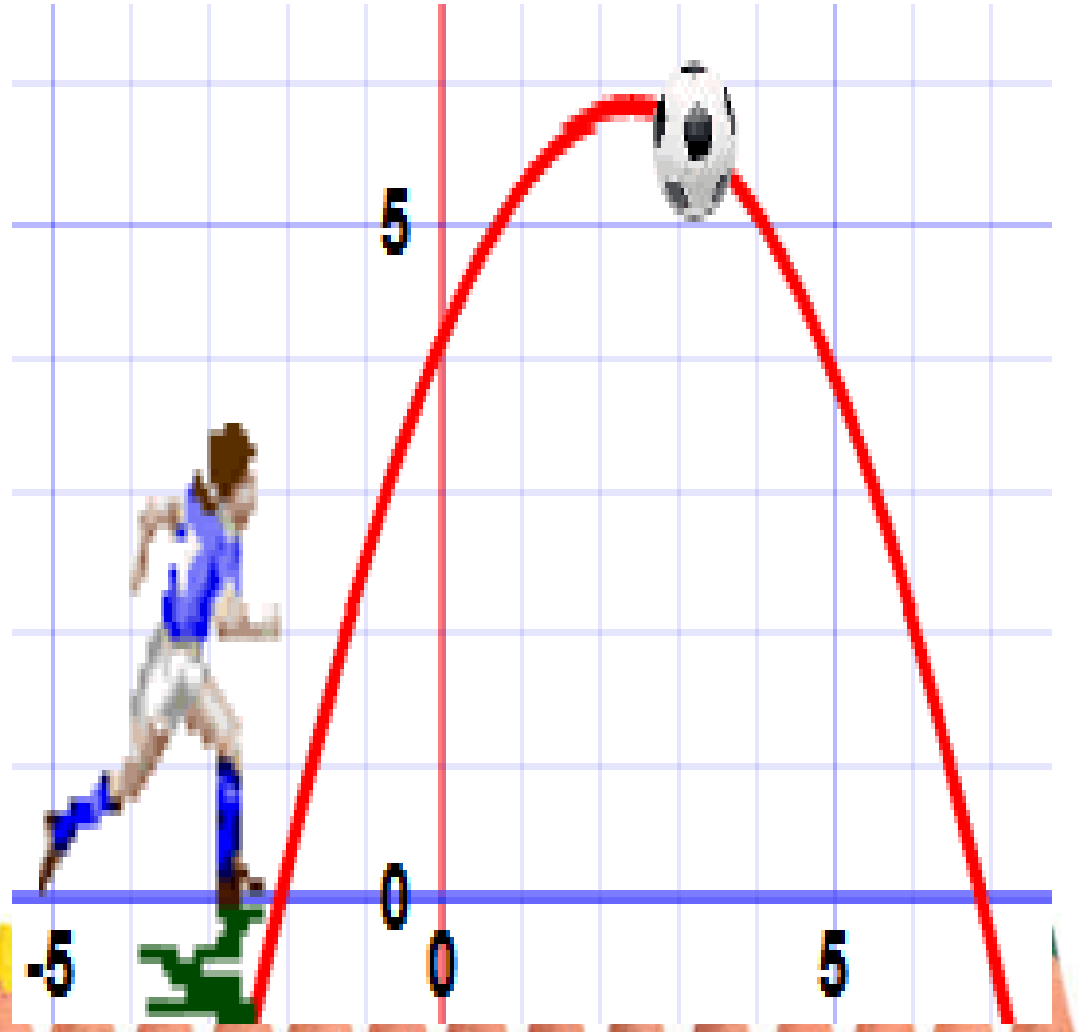
Learning Objectives

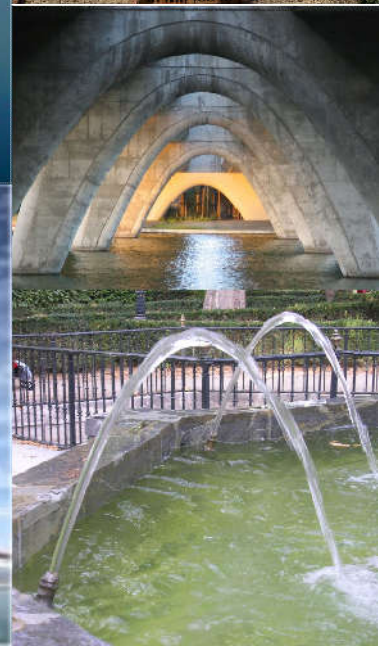
Solve quadratic equations using completing the square method

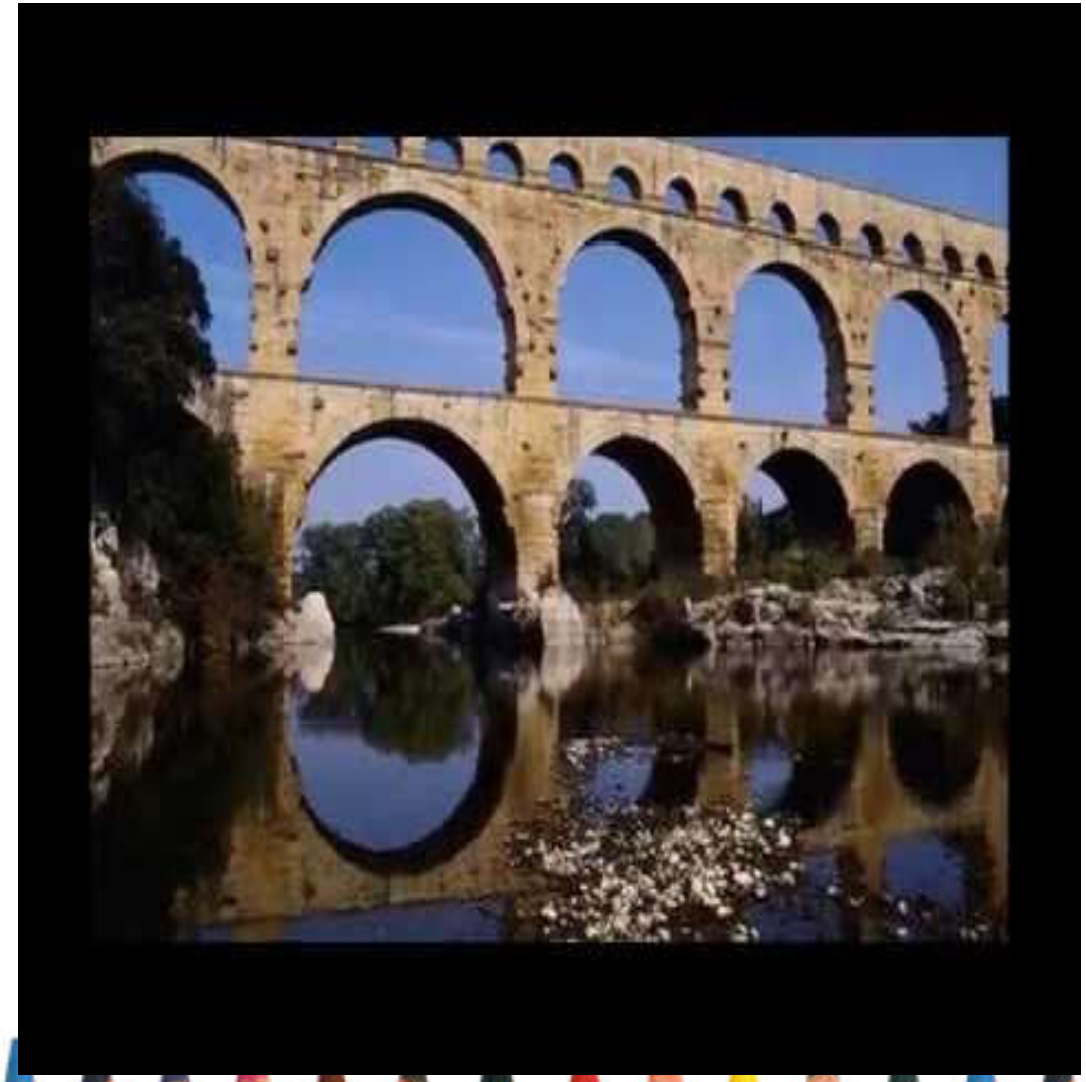
Solve quadratic equations using the quadratic formula

Solve word problems

AREAS OF APPLICATION OF QUADRATIC EQUATION IN REAL LIFE







FOOTBALL

ARCHITECTURAL DESIGNS

BUILDING CONSTRUCTION

MILITARY WARS

TAILORING

INDUSTRIAL DESIGNS

ALL HOUSE HOLD MATERIALS WITH CURVED EDGES AND SURFACES

A quadratic equation is an equation whose highest power of the variable x is 2, that is, x^2.

The quadratic equation is usually of the form:

$$ax^2 + bx + c = 0$$

a = 5

b = 2

$y = 5x^2 + 2x + 1$

c = 1

a = 1

b = -6

$$y = x^2 - 6x + 11$$

c = 11

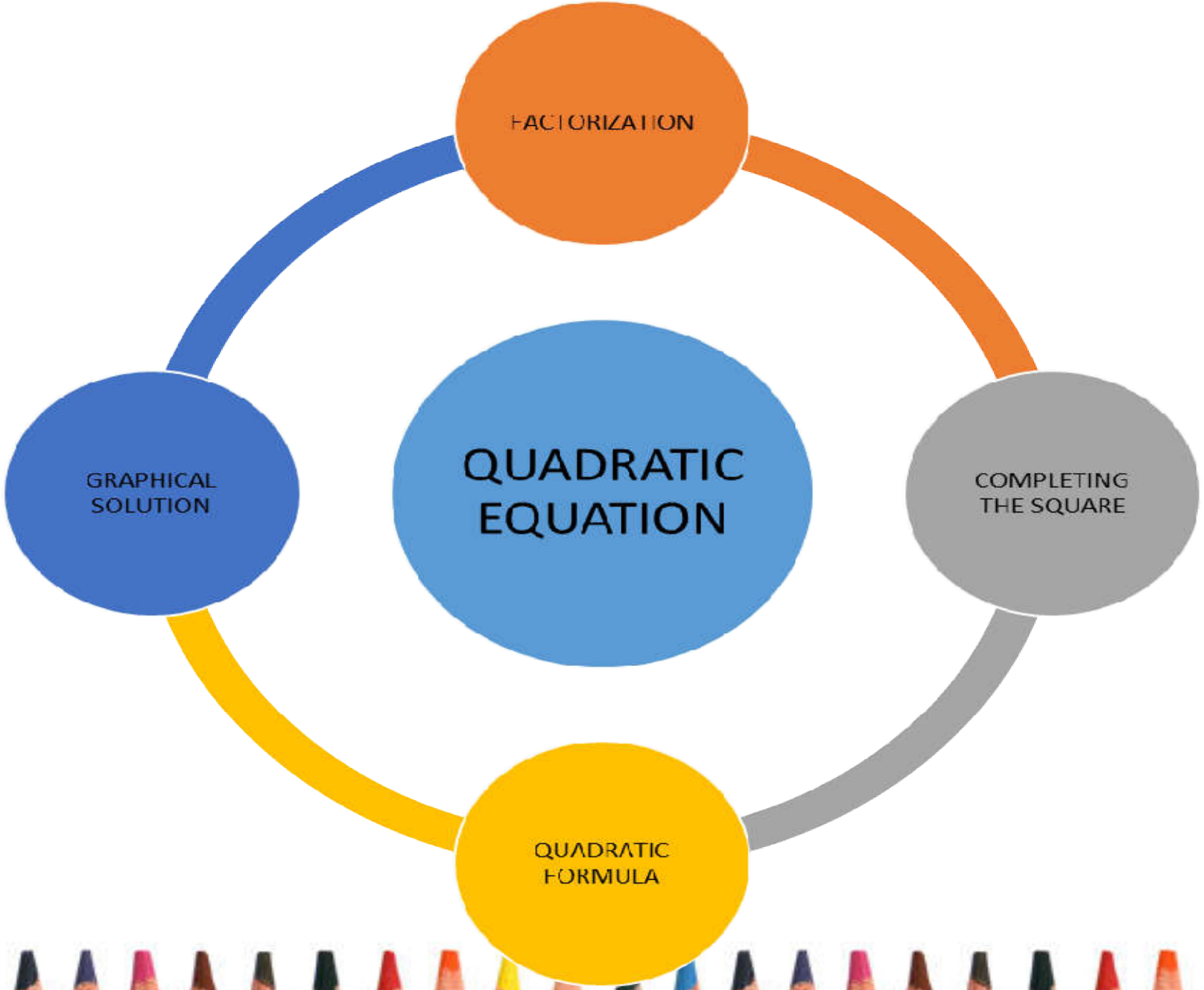
It can also be stated as

$$y = ax^2 + bx + c,$$

where y is a dependent variable and x is an independent variable.

METHODS OF SOLVING QUADRATIC EQUATION

- Factorization (Factor) Method
- General Formula Method
- Completing the Square Method
- Graphical Method


FACTORIZATION
GRAPHICAL SOLUTION
QUADRATIC EQUATION
COMPLETING THE SQUARE
QUADRATIC FORMULA

SOLVING QUADRATIC EQUATION

USING

COMPLETING THE SQUARE METHOD

WHEN TO USE COMPLETING THE SQUARE METHOD

1. ***When the question specifically requires you to use it***
2. ***When the solution is likely to give an irrational number***
3. ***As another method for solving quadratic equation***
4. ***Used to determine the quadratic formula for solving quadratic equations***

STEPS TO USING COMPLETING THE SQUARES

1. Divide through by the coefficient of x^2
2. Collect the like terms by taking the constant to the right hand side
3. Add the square of half of the coefficient of **x** to both sides
4. Factorize the left hand side and simplify the right hand side
5. Take the square root of both sides
6. Collect the like terms
7. Simplify to find the value of x

Using completing the square method, solve the equation:

$$x^2 - x - 6 = 0$$

STEP1

Divide through by the coefficient of x^2

STEP 2

Collect the like terms by taking the constant to the right hand side

STEP 3

Add the square of half of the coefficient of **x** to both sides

STEP 4

Factorize the left hand side and simplify the right hand side

STEP 5

Take the square root of both sides

STEP 6
Collect the like terms

STEP 7

Simplify to find the value of x

NOW LET US CONSIDER THESE EXAMPLES BELOW

FROM THE PAST QUESTIONS

Solve the equation $2x^2 + 7x + 12 = 0$ **by method of** *completing the square. Give your answer correct to 3 decimal places.*

(WASSCE NOV. 2001)

STEP1

Divide through by the coefficient of x^2

STEP 2

Collect the like terms by taking the constant to the right hand side

STEP 3

Add the square of half of the coefficient of **x** to both sides

STEP 4

Factorize the left hand side and simplify the right hand side

STEP 5

Take the square root of both sides

STEP 6
Collect the like terms

STEP 7

Simplify to find the value of x

SOLVING QUADRATIC EQUATION USING QUADRATIC FORMULA

THE QUADRATIC FORMULA IS GIVEN AS:

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Find two numbers which differ by 4 and whose product is 45.

ATTEMPT THE FOLLOWING STAY AT HOME EXERCISES

1. Using completing the squares method, solve correct to 2 decimal places, $\frac{x-2}{4} = \frac{x+2}{2x}$

2. Find the value of x for which $\frac{2x+5}{2x + 13x-15}$ is undefined

(NOTE: An equation is undefined if the denominator equals zero)

3. Hence, use the formula to find the solution of $3x^2 - 5x + 2 = 0$, leaving your answer in two decimal places

THANKS FOR LISTENING