ACADEMIC WORLD SCHOOL™
BEMETARA

SESSION: 2023-24
SUMMER VACATION ASSIGNMENT
CLASS: X

General Instructions:

1. Write in a clear and legible handwriting.
2. Complete all the homework in a separate subject Summer Vacation Homework Notebook.
3. **DO NOT COPY AND PASTE FROM THE INTERNET**. (Assignment will be rejected)
4. In case of reference from the internet, you may:
   A. Read the content from the internet, if you wish and paraphrase (Rewrite in your own words)
   B. Mention the source of your information by providing the link from the internet for the verification by the teachers.
5. Marks awarded will be counted in the final scores at the end of the session.
6. The Summer Vacation HW will be submitted immediately upon arrival to school after Summer Vacation.
7. For any assignment related query do post your question on E-Mail Id of respective subject teacher. List of Subject Teacher's E-Mail ID attached.

Note for the Parents:

Parents are requested to guide his/her wards to complete their assignments honestly and submit by the due date.

CLASS: X

SUBJECT – ENGLISH LANG. & LIT. (184)

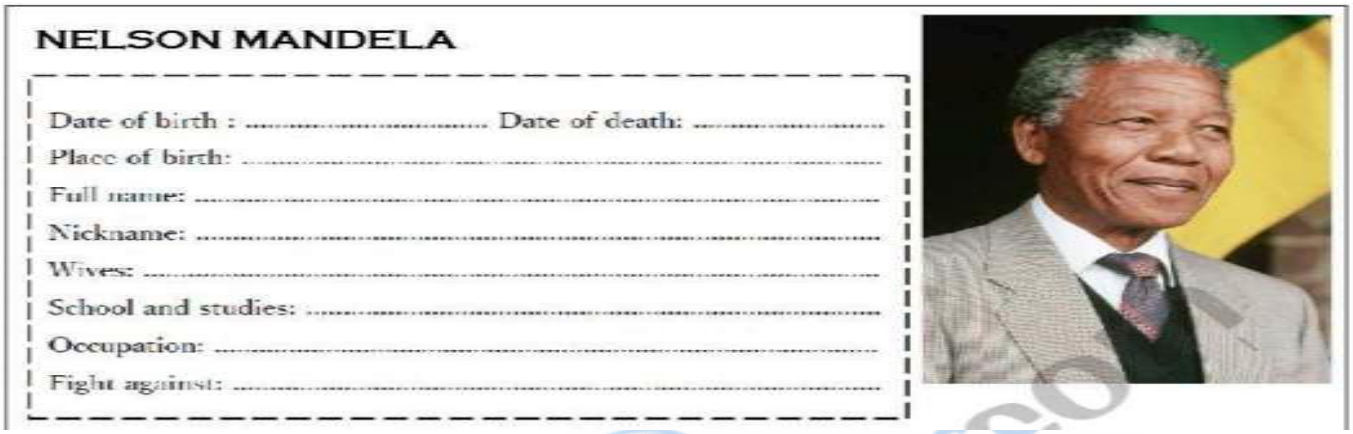
Activity – 01

- **ANALYSING**

1. How did the system of racial discrimination hurt the people of South Africa?

- **EVALUATION**

Collect the information about Nelson Mandela and write a profile on the character and personality of Nelson Mandela. (Your activity should include all the points about Mandela given in the image & add your own points)



- **CREATING**

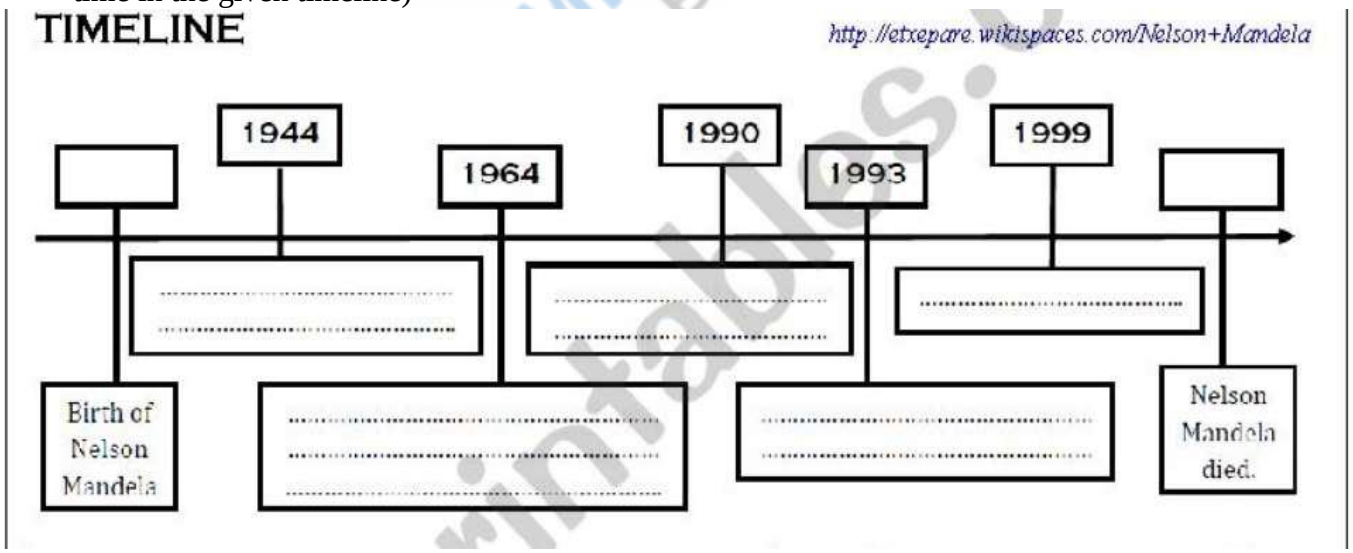
➢ Find information about these people and prepare a photo album of your profile pages based on their service to the humanity.

(Materials required: A4 size paper, colour pens, colour pencils, or anything of your choice to make the sheet
presentable)

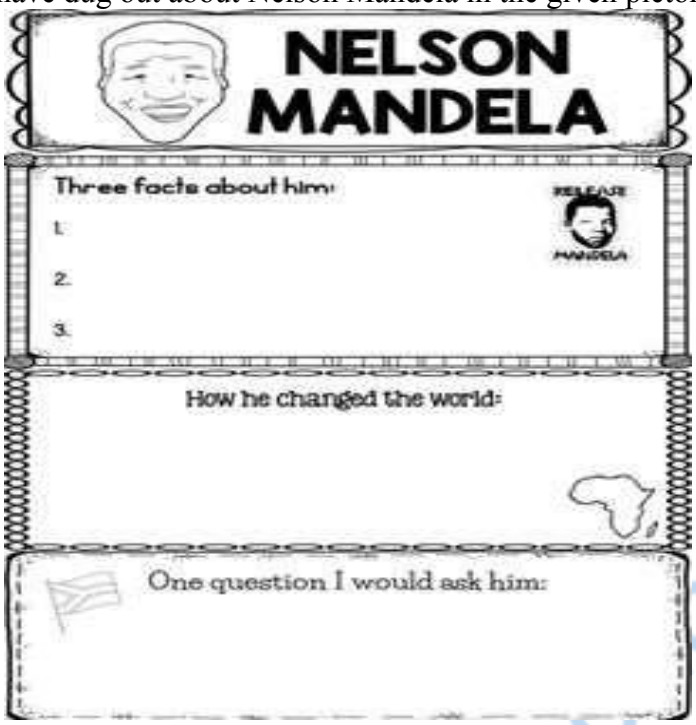
1. NELSON MANDELA

2. MOTHER TERESA

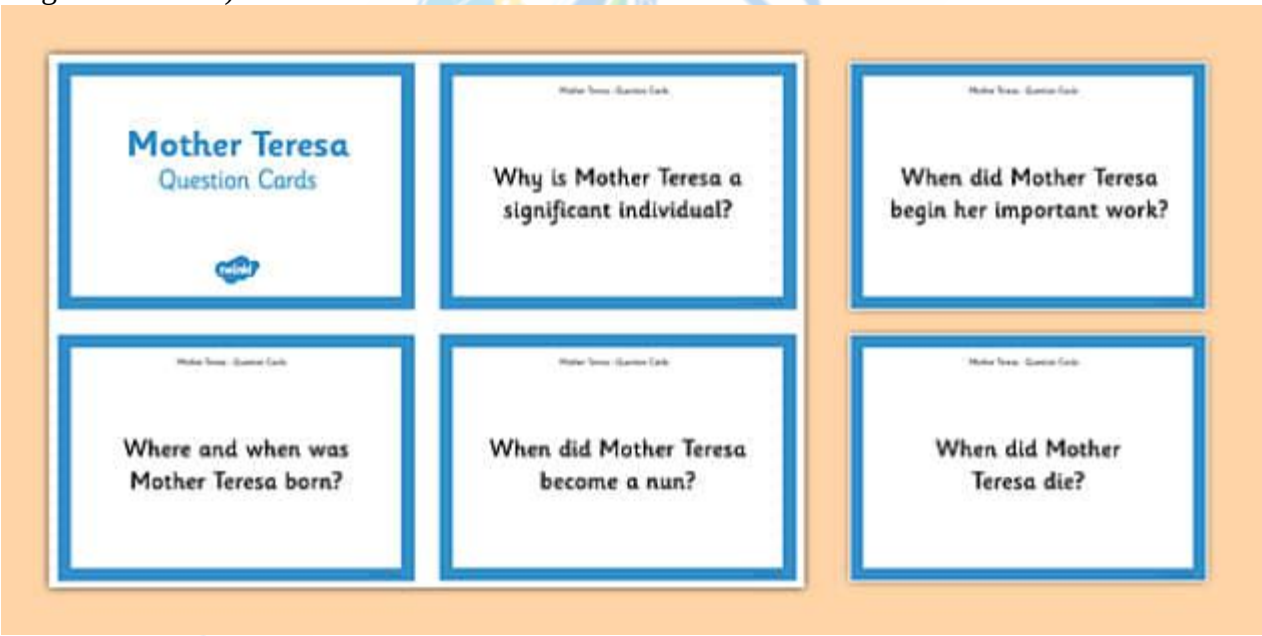
➢ Prepare the Timeline of Mandela's achievements, his activities… (You may add your own period of time in the given timeline)



- Write down the facts you have dug out about Nelson Mandela in the given pictorial form…



- Find information about Mother Teresa in the form of time-line. (You may add your own period of time in the given timeline)



Activity -02

Read any three books of your choice and put in writing the following for each book:

•Write a statement giving essential information about the book : title, author, first copyright date, type of book, general subject matter, special features, price..etc.

•What genre is the book? Is it fiction or nonfiction?

•Start with a couple of sentences describing what the book is about.

•State the author's purpose in writing the book.

•Think about how you were affected by the book and if any of your opinions or feelings change because of it.

•Discuss what you particularly liked about the book.

•Mention any thing you disliked about the book.

- **Creative Writing**

- Write an essay after a thorough research on ground water level with statistics and facts in India.
- Make a project report on ground water harvesting system and its technology. How does it impact in restoration of ground water level.
- Write a researched essay on, 'Water as a sustainable resource'.
  Note : The work should be done in 800 to 1000 words with pictures and drawings as applicable in booklet style.
- Write **A Letter to God** thanking **Him** for Everything **He** Has Given **You** in Life **enlisting His Blessings (Ten blessings in any form)** Design a beautiful envelope addressing **GOD with** pictorial representation & beautifully hand written **Letter** placed inside.
- Imagine that **Frost** is of present day and has been invited to write for an **e-zine-"Teen Talk".** He chooses to draw upon his experience with the crow and the dusting of snow to share his thoughts on **' Every Cloud has a silver lining .'** As **Frost,** express your thoughts for the **e-zine.** Also write the poem **'Dust of Snow' depicting Snow art painting with a flavor of craft work.**
- Being innovative with values : Create your own diary in which you will write daily about any one positive change which you will bring in yourself like being organized or being punctual in 80-100 words.

- **Make a small handmade decorative diary to show your creativity.**

- Write an essay on **'My Plans for Summer Vacations'** like what new skills you are going to learn and explore in about 500 words.

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कक्षा-10

विषय-हिंदी (085)

ग्रीष्म कालीन गृह कार्य-

काला सेतु परियोजना- (सामूहिक कार्य)

गुजरात और छत्तीसगढ़ राज्य पर आधारित-

1. गुजरात और छत्तीसगढ़ की शिक्षा
2. गुजरात और छत्तीसगढ़ की कृषि
3. गुजरात और छत्तीसगढ़ के उधोग
4. गुजरात और छत्तीसगढ़ के धार्मिक स्थल
5. गुजरात और छत्तीसगढ़ का इतिहास
6. गुजरात और छत्तीसगढ़ की संस्कृति

CLASS – X Science (086)
SECTION - A

ART INTEGRATED PROJECT

1. Locate in the outline map of India any 5 major Industries & their products belonging to the state of Gujarat and Chhattisgarh and then classify them under different groups on the basis of
   i) Source of raw materials
   ii) Capital Investment
   iii) Ownership
   iv) Bulk & weight of Raw materials & finished goods

➢ **Task to be accomplished:-**

1. Designing of out- look of scrap book.
2. Collect the pictures and name of major manufacturing industries and their products.
3. Basic principles involved in the process of manufacturing.
4. Area/ place belong to the manufacturing.
5. Products and its wide range.
6. Draw a histogram to compare the capacity of production of each unit in between the two states.
5. Conclusion

OR

Compare the ecological impact of wild life of Gujarat and Chhattisgarh. Compare the wild life of the species/ forest resources of both the states and show in graph/picture/table/ map.:-

➢ **Task to be accomplished:-**

1. Collect data about the ecosystems.
2. Wild life of the Gujarat and the Chhattisgarh
3. Classification of wild life species and its varieties.
4. Endangered, Vulnerable and extinct species
5. Draw pie charts to compare the number of various wild animals of the two states.

SECTION – B

- Complete the Write up of your Lab Manuals [Phy, Chem, Bio].
  (At least 3 experiments each)

SECTION – C

*Solve all the questions given below in a A-4 size paper and submit them in a stick file.

Biology

Q.1) Draw a neat labeled diagram of human alimentary canal and answer the followings
(a) Make a list of all the Digestive enzymes that secreted in different parts of alimentary canal & write their functions.
(b)Mention the role of Hydrochloric acid (HCl) secrete from stomach. What is the pH of it?
(c)What do you mean by Villi? Where is it found and write its role.
Q.2) What is called translocation? How is it different from transpiration?
Q.3) Explain an activity to show that light is necessary for photosynthesis.
Q.4) Paste any 6 pictures of organisms that exhibit heterotrophic mode of nutrition and write about them

Chemistry

Q.1) A shining metal 'M', on burning gives a dazzling white flame and change to a white powder 'N'.
(a) Identify 'M' and 'N'.
(b) Represent the above reaction in the form of a balanced chemical equation.
(c) Does 'M' undergo oxidation or reduction in this reaction? Justify.

Q.2) Lead nitrate solution is added to a test tube containing potassium iodide solution.
(a) Write the name and colour of the compound precipitated.
(b) Write the balanced chemical equation for the reaction involved.
(c) Name the type of this reaction justifying your answer.

Q.3) Translate the following statements into chemical equations and then balance them:-
1) Steam is passed over heated Iron to form magnetic Oxide of Iron
2) Carbon di-Sulphide burns in air to give Carbon dioxide and Sulphur dioxide.
3) Magnesium burns in presence of Nitrogen to form Magnesium nitride.

Q.4) With the help of an activity show the displacement reaction between Zinc granules and Dil.HCl

Q.5) A Silver article generally turns black when kept in the open for a few days. The article when rubbed with tooth paste it again starts shining.
a) Why do silver articles turn black when kept in the open for a few days? Name the phenomenon which is involved.
b) Name the black substance formed and write its chemical formula.

Physics

Q.1) a) Collect the electricity bills of your house for last six months. (Bills are available either soft copy from browsing the app of electricity board of your state or getting the hard copy being received at your house)
b) Go through the bill carefully and find out how much units per month is consumed and the amount of money is paid. Enter the data in a tabular form.
c) Draw a histogram for the above collected data and find out in which month maximum electricity is used and the amount of bill paid.

Q.2) Write some of the practices to be followed in order to decrease the consumption of electricity

Q.3) Collect at least ten resistors of different ohms and stick them in your file. Write the uses of these resistors in an electric circuit.

Q.4) Draw at least ten symbols of some commonly used components in circuit diagram.

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- ✓ Rubrics:-
  1) A.I.P. = 5 marks
     [Presentation- 2 marks, Content- 2 marks, Diagrams/Pictures- 1 marks]
  2) Correct answers of Physics, Chemistry, Biology = 10 marks
  3) Lab manual write ups = 5 marks

** 20 marks is to be converted into 10 while making award list.

####

CLASS: X

Subject: Social Science (087)

PREPARE A PROJECT FILE ON ONE OF FOLLOWING TOPIC GIVEN BELOW OF 32 PAGES IN THE PROPER FORMAT AS ASSIGNED BY THE CBSE TO COMPLETE POSITIVELY DURING SUMMER HOLIDAYS.

Project work of class X

 Every student has to compulsorily undertake one project on

Consumer Awareness

OR

Social Issues

OR

Sustainable Development

(Integrate with art wherever possible)

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Class- X
Subject: Mathematics (041)

To be done in Maths lab manual.

Activity 1:
To draw the graph of a quadratic polynomial and observe: (i) The shape of the curve when the coefficient of x^2 is positive. (ii) The shape of the curve when the coefficient of x^2 is negative. (iii) Its number of zeroes.

Activity 2:
To verify the conditions of consistency/ inconsistency for a pair of linear equations in two variables by graphical method.

Activity 3:
To identify Arithmetic Progressions in some given lists of numbers (patterns).

Activity 4:
To find the sum of first n natural numbers.

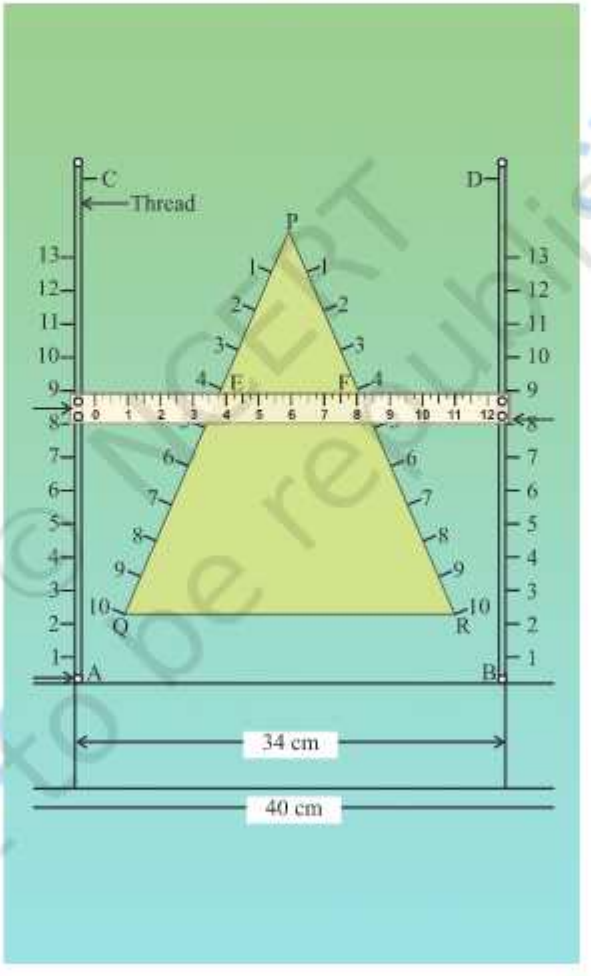
Activity 5:
To establish a formula for the sum of first n terms of an Arithmetic Progression.

Activity 6:
To verify the distance formula by graphical method.

To be done in stick file
Write a brief description of any one topic (Page limit at least 10)

1. Real number.
2. Co-ordinate geometry.
3. Arithmetic progressions.
4. Probability.
5. Surfaces area and volumes
6. Areas related to circle.

Activities for
Class X



Geometry was always considered more as a discipline of the mind than any other part of mathematics, for it could boast closer relations to logic. Genuine deductivity was the privilege of geometry, whereas the business of algebra was substitution into and transforming formulae. On the other hand the pragmatic point of view would require only a few theorems and not the geometry prescribed by Euclidean tradition. Some people are prepared to teach more useless things in mathematics, but object to geometry being a weak system.

– H. Freudenthal.

Activity 1

Objective

To find the HCF of two numbers experimentally based on Euclid Division Lemma.

Material Required

Cardboard sheets, glazed papers of different colours, scissors, ruler, sketch pen, glue etc.

Method of Construction

1. Cut out one strip of length a units, one strip of length b units ($b < a$), two strips each of length c units ($c < b$), one strip of length d units ($d < c$) and two strips each of length e units ($e < d$) from the cardboard.
2. Cover these strips in different colours using glazed papers as shown in Fig. 1 to Fig. 5:

Fig. 1

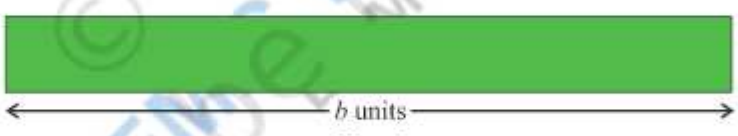


Fig. 2

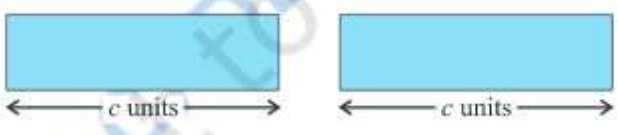


Fig. 3

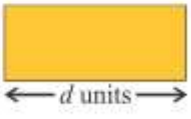


Fig. 4

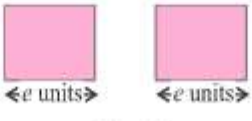


Fig. 5

3. Stick these strips on the other cardboard sheet as shown in Fig. 6 to Fig. 9.

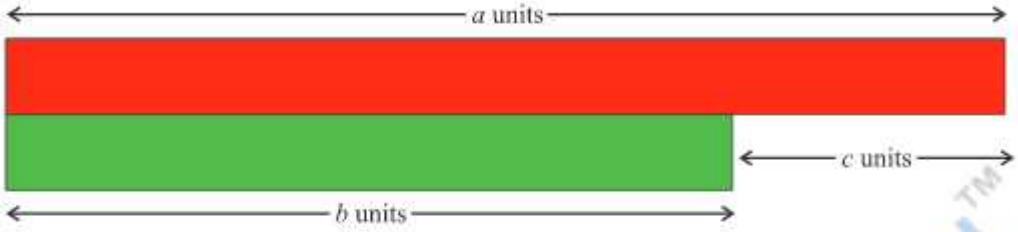


Fig. 6

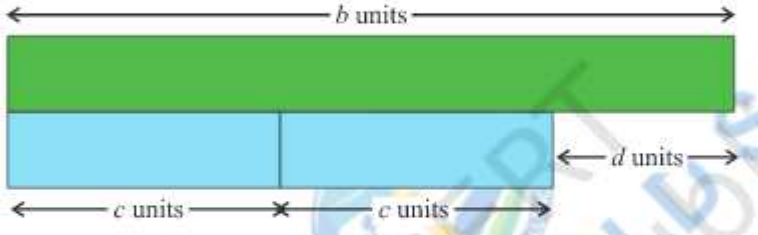


Fig. 7

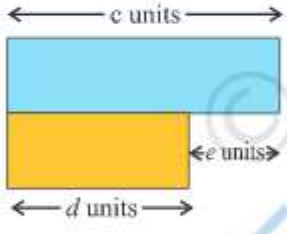


Fig. 8

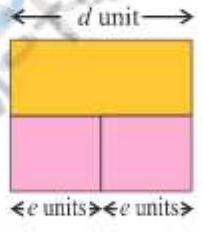


Fig. 9

Demonstration

As per Euclid Division Lemma,

Fig. 6 depicts $a = b \times 1 + c$ $(q = 1, r = c)$ (1)

Fig. 7 depicts $b = c \times 2 + d$ $(q = 2, r = d)$ (2)

Fig.8 depicts $c = d \times 1 + e$ $(q = 1, r = e)$ (3)

and Fig. 9 depicts $d = e \times 2 + 0$ $(q = 2, r = 0)$ (4)

As per assumptions in Euclid Division Algorithm,

HCF of a and b = HCF of b and c

= HCF of c and d = HCF of d and e

The HCF of d and e is equal to e, from (4) above.

So, HCF of a and b = e.

Observation

On actual measurement (in mm)

a = ... , b = ... , c = ... , d = ... , e = ...

So, HCF of _____ and _____ = ...

Application

The process depicted can be used for finding the HCF of two or more numbers, which is known as finding HCF of numbers by Division Method.

Activity 2

Objective

To draw the graph of a quadratic polynomial and observe:

(i) The shape of the curve when the coefficient of x^2 is positive.

(ii) The shape of the curve when the coefficient of x^2 is negative.

(iii) Its number of zeroes.

Material Required

Cardboard, graph paper, ruler, pencil, eraser, pen, adhesive.

Method of Construction

1. Take cardboard of a convenient size and paste a graph paper on it.
2. Consider a quadratic polynomial $f(x) = ax^2 + bx + c$
3. Two cases arise:

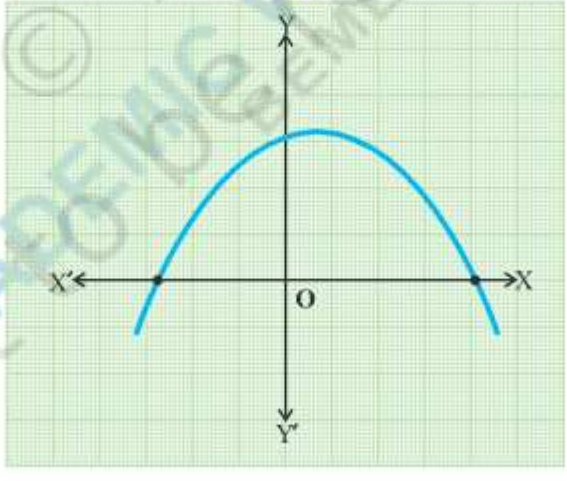


Fig. 1

(i) $a > 0$ (ii) $a < 0$

4. Find the ordered pairs $(x, f(x))$ for different values of x.
5. Plot these ordered pairs in the cartesian plane.

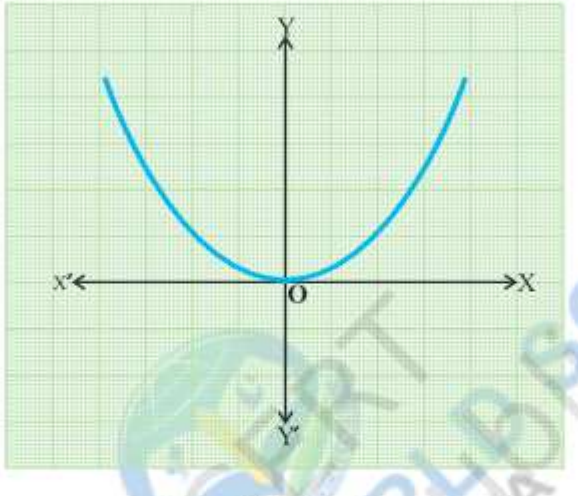


Fig. 2

6. Join the plotted points by a free hand curve [Fig. 1, Fig. 2 and Fig. 3].

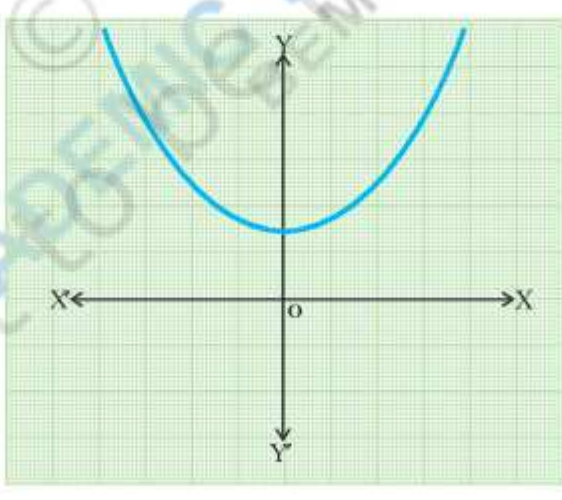


Fig. 3

Demonstration

1. The shape of the curve obtained in each case is a parabola.
2. Parabola opens upward when coefficient of x^2 is positive [see Fig. 2 and Fig. 3].
3. It opens downward when coefficient of x^2 is negative [see Fig. 1].
4. Maximum number of zeroes which a quadratic polynomial can have is 2.

Observation

1. Parabola in Fig. 1 opens _____
2. Parabola in Fig. 2 opens _____
3. In Fig. 1, parabola intersects x-axis at _____ point(s).
4. Number of zeroes of the given polynomial is _____.
5. Parabola in Fig. 2 intersects x-axis at _____ point(s).
6. Number of zeroes of the given polynomial is _____.
7. Parabola in Fig.3 intersects x-axis at _____ point(s).
8. Number of zeroes of the given polynomial is _____.
9. Maximum number of zeroes which a quadratic polynomial can have is _____.

Application

This activity helps in

1. understanding the geometrical representation of a quadratic polynomial
2. finding the number of zeroes of a quadratic polynomial.

Note

Points on the graph paper should be joined by a free hand curve only.

Activity 3

Objective

To verify the conditions of consistency/ inconsistency for a pair of linear equations in two variables by graphical method.

Material Required

Graph papers, pencil, eraser, cardboard, glue.

Method of Construction

1. Take a pair of linear equations in two variables of the form

   $a_1x + b_1y + c_1 = 0$ (1)

   $a_2x + b_2y + c_2 = 0$, (2)

   where a_1, b_1, a_2, b_2, c_1 and c_2 are all real numbers; a_1, b_1, a_2 and b_2 are not simultaneously zero.

There may be three cases :

Case I : $\frac{a_1}{a_2} \neq \frac{b_1}{b_2}$

Case II: $\frac{a_1}{a_2} = \frac{b_1}{b_2} = \frac{c_1}{c_2}$

Case III: $\frac{a_1}{a_2} = \frac{b_1}{b_2} \neq \frac{c_1}{c_2}$

2. Obtain the ordered pairs satisfying the pair of linear equations (1) and (2) for each of the above cases.
3. Take a cardboard of a convenient size and paste a graph paper on it. Draw two perpendicular lines X′OX and YOY′ on the graph paper (see Fig. 1). Plot the points obtained in Step 2 on different cartesian planes to obtain different graphs [see Fig. 1, Fig. 2 and Fig.3].

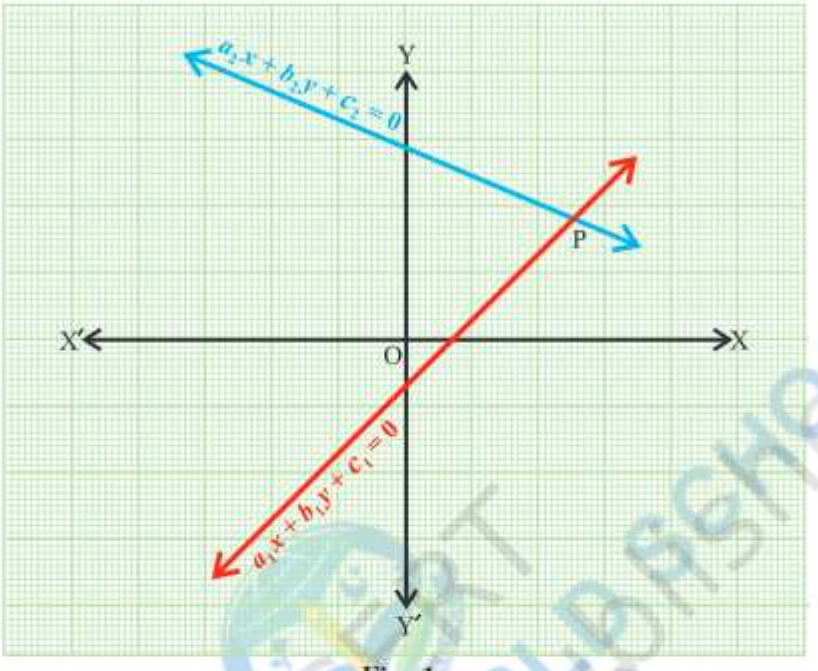


Fig. 1

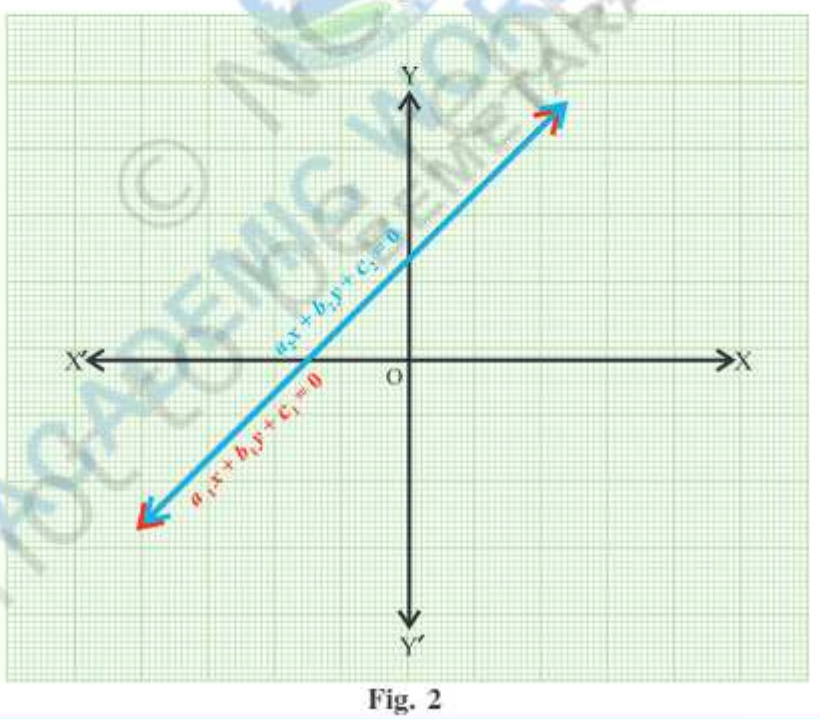


Fig. 2

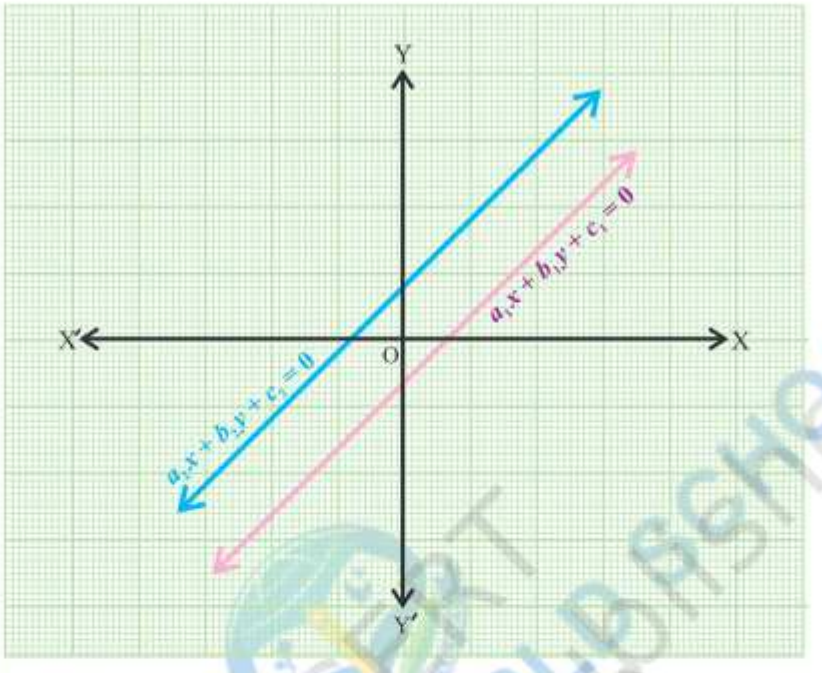


Fig. 3

Demonstration

Case I: We obtain the graph as shown in Fig. 1. The two lines are intersecting at one point P. Co-ordinates of the point P (x,y) give the unique solution for the pair of linear equations (1) and (2).

Therefore, the pair of linear equations with $\frac{a_1}{a_2} \neq \frac{b_1}{b_2}$ is consistent and has the unique solution.

Case II: We obtain the graph as shown in Fig. 2. The two lines are coincident. Thus, the pair of linear equations has infinitely many solutions.

Therefore, the pair of linear equations with $\frac{a_1}{a_2} = \frac{b_1}{b_2} = \frac{c_1}{c_2}$ is also consistent as well as dependent.

Case III: We obtain the graph as shown in Fig. 3. The two lines are parallel to each other.

This pair of equations has no solution, i.e., the pair of equations with $\frac{a_1}{a_2} = \frac{b_1}{b_2} \neq \frac{c_1}{c_2}$ is inconsistent.

Observation

1. a_1 = _____, a_2 = _____,

   b_1 = _____, b_2 = _____,

   c_1 = _____, c_2 = _____,

So, $\frac{a_1}{a_2}$ = ..., $\frac{b_1}{b_2}$ = ..., $\frac{c_1}{c_2}$ = ...

$\frac{a_1}{a_2}$	$\frac{b_1}{b_2}$	$\frac{c_1}{c_2}$	Case I, II or III	Type of lines	Number of solution	Conclusion Consistent/ inconsistent/ dependent

Application

Conditions of consistency help to check whether a pair of linear equations have solution (s) or not.

In case, solutions/solution exist/exists, to find whether the solution is unique or the solutions are infinitely many.

Activity 4

Objective

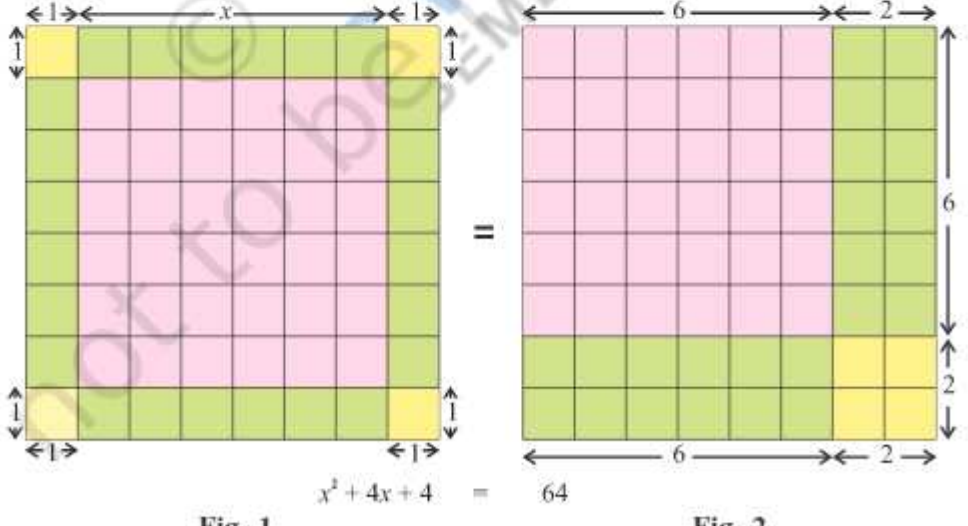
To obtain the solution of a quadratic equation ($x^2 + 4x = 60$) by completing the square geometrically.

Material Required

Hardboard, glazed papers, adhesive, scissors, marker, white chart paper.

Method of Construction

1. Take a hardboard of a convenient size and paste a white chart paper on it.
2. Draw a square of side of length x units , on a pink glazed paper and paste it on the hardboard [see Fig. 1] . Divide it into 36 unit squares with a marker.
3. Alongwith each side of the square (outside) paste rectangles of green glazed paper of dimensions $x \times 1$, i.e., 6×1 and divide each of them into unit squares with the help of a marker [see Fig. 1].
4. Draw 4 squares each of side 1 unit on a yellow glazed paper, cut them out and paste each unit square on each corner as shown in Fig. 1.



$x^2 + 4x + 4 = 64$

Fig. 1 Fig. 2

5. Draw another square of dimensions 8 × 8 and arrange the above 64 unit squares as shown in Fig. 2.

Demonstration

1. The first square represents total area $x^2 + 4x + 4$.
2. The second square represents a total of 64 (60 + 4) unit squares.

   Thus, $x^2 + 4x + 4 = 64$

   or $(x + 2)^2 = (8)^2$ or $(x + 2) = \pm 8$

   i.e., $x = 6$ or $x = -10$

   Since x represents the length of the square, we cannot take $x = -10$ in this case, though it is also a solution.

Observation

Take various quadratic equations and make the squares as described above, solve them and obtain the solution(s).

Application

Quadratic equations are useful in understanding parabolic paths of projectiles projected in the space in any direction.

Activity 5

Objective

To identify Arithmetic Progressions in some given lists of numbers (patterns).

Material Required

Cardboard, white paper, pen/pencil, scissors, squared paper, glue.

Method of Construction

1. Take a cardboard of a convenient size and paste a white paper on it.
2. Take two squared papers (graph paper) of suitable size and paste them on the cardboard.

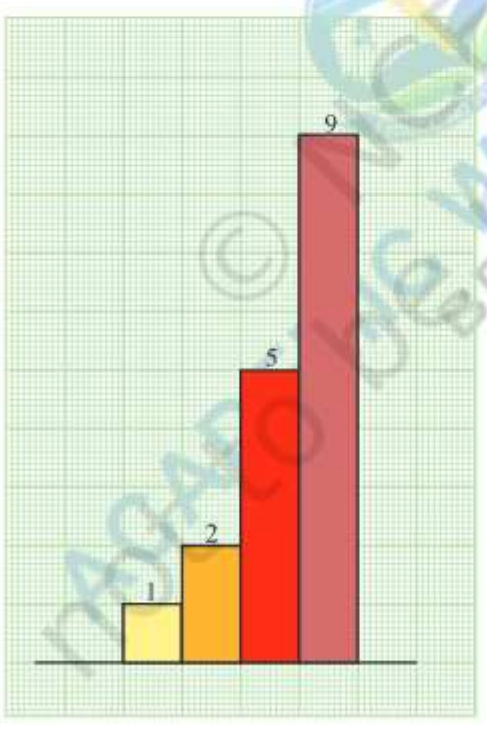


Fig. 1

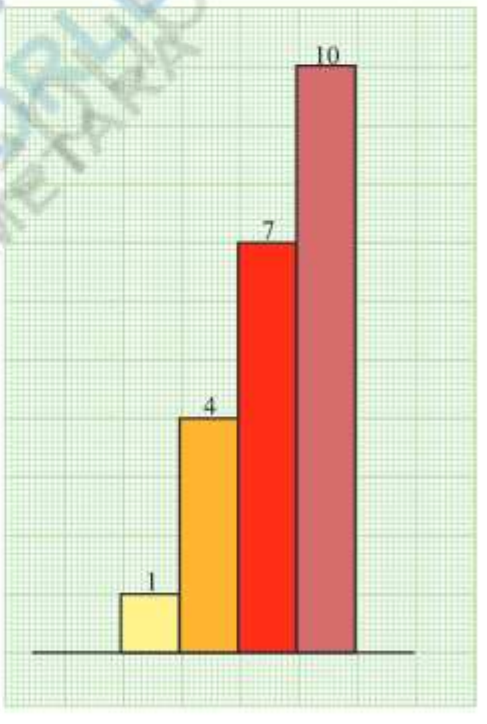


Fig. 2

3. Let the lists of numbers be

   (i) 1, 2, 5, 9, ... (ii) 1, 4, 7, 10, ...

4. Make strips of lengths 1, 2, 5, 9 units and strips of lengths 1, 4, 7, 10 units and breadth of each strip one unit.

5. Paste the strips of lengths 1, 2, 5, 9 units as shown in Fig. 1 and paste the strips of lengths 1, 4, 7, 10 units as shown in Fig. 2.

Demonstration

1. In Fig. 1, the difference of heights (lengths) of two consecutive strips is not same (uniform). So, it is not an AP.

2. In Fig. 2, the difference of heights of two consecutive strips is the same (uniform) throughout. So, it is an AP.

Observation

In Fig. 1, the difference of heights of first two strips = _____

the difference of heights of second and third strips = _____

the difference of heights of third and fourth strips = _____

Difference is _____ (uniform/not uniform)

So, the list of numbers 1, 2, 5, 9 _____ form an AP. (does/does not)

Write the similar observations for strips of Fig.2.

Difference is _____ (uniform/not uniform)

So, the list of the numbers 1, 4, 7, 10 _____ form an AP. (does/does not)

Application

This activity helps in understanding the concept of arithmetic progression.

Note

Observe that if the left top corners of the strips are joined, they will be in a straight line in case of an AP.

Activity 6

Objective

To find the sum of first n natural numbers.

Material Required

Cardboard, coloured papers, white paper, cutter, adhesive.

Method of Construction

1. Take a rectangular cardboard of a convenient size and paste a coloured paper on it. Draw a rectangle ABCD of length 11 units and breadth 10 units.
2. Divide this rectangle into unit squares as shown in Fig. 1.
3. Starting from upper left-most corner, colour one square, 2 squares and so on as shown in the figure.

Demonstration

1. The pink colour region looks like a stair case.
2. Length of 1st stair is 1 unit, length of 2nd stair is 2 units, length of 3rd stair 3 units, and so on, length of 10th stair is 10 units.

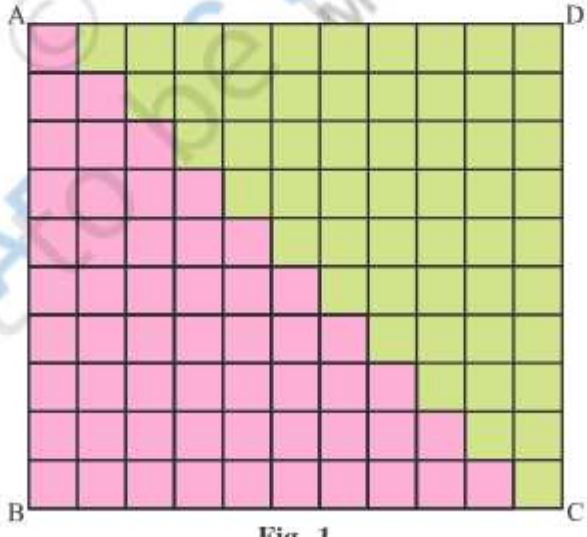


Fig. 1

3. These lengths give a pattern

   1, 2, 3, 4, ..., 10,

   which is an AP with first term 1 and common difference 1.

4. Sum of first ten terms

   $= 1 + 2 + 3 + ... + 10 = 55$ (1)

   Area of the shaded region $= \frac{1}{2}$ (area of rectangle ABCD)

   $= \frac{1}{2} \times 10 \times 11$, which is same as obtained in (1) above. This shows that the sum of the first 10 natural numbers is $\frac{1}{2} \times 10 \times 11 = \frac{1}{2} \times 10(10+1)$.

   This can be generalised to find the sum of first n natural numbers as

   $$S_n = \frac{1}{2} n(n+1) \quad (2)$$

OBSERVATION

For $n = 4$, S_n = ...

For $n = 12$, S_n = ...

For $n = 50$, S_n = ...

For $n = 100$, S_n = ...

APPLICATION

Result (2) may be used to find the sum of first n terms of the list of numbers:

1. $1^2, 2^2, 3^2, ...$
2. $1^3, 2^3, 3^3, ...$

   to be studied in Class XI.

Activity 7

Objective

To find the sum of the first n odd natural numbers.

Material Required

Cardboard, thermocol balls, pins, pencil, ruler, adhesive, white paper.

Method of Construction

1. Take a piece of cardboard of a convenient size and paste a white paper on it.
2. Draw a square of suitable size on it (10 cm × 10 cm).
3. Divide this square into unit squares.
4. Fix a thermocol ball in each square with the help of a pin as shown in Fig. 1.
5. Enclose the balls as shown in the figure.

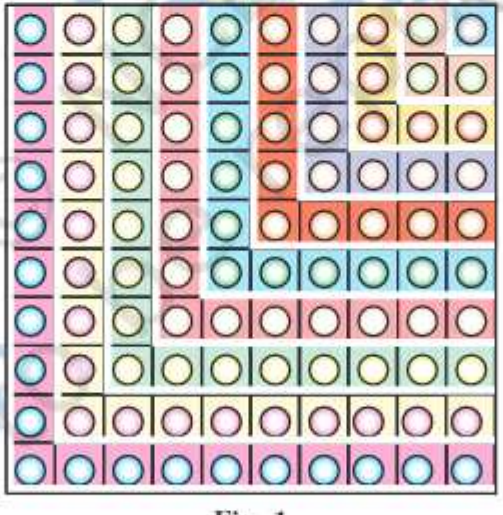


Fig. 1

Demonstration

Starting from the uppermost right corner, the number of balls in first enclosure (blue colour) = 1 $(=1^2)$,

the number of balls in first 2 enclosures = 1 + 3 = 4 ($=2^2$),

the number of balls in first 3 enclosures = 1 + 3 + 5 = 9 ($=3^2$),

the number of balls in first 10 enclosures = 1 + 3 + 5 + ... + 19 = 100 ($=10^2$).

This gives the sum of first ten odd natural numbers. This result can be generalised for the sum of first n odd numbers as:

$S_n = 1 + 3 + \ldots\ldots\ldots + (2n - 1) = n^2$ (1)

Observation

For $n = 4$ in (1), S_n = ...

For $n = 5$ in (1), S_n = ...

For $n = 50$ in (1), S_n = ...

For $n = 100$ in (1), S_n = ...

Application

The activity is useful in determining formula for the sum of the first n odd natural numbers.

Activity 8

Objective

To find the sum of the first n-even natural numbers.

Material Required

Cardboard, thermocol balls, pins, pencil, ruler, white paper, chart paper, adhesive.

Method of Construction

1. Take a piece of cardboard of a convenient size and paste a white paper on it.
2. Draw a rectangle of suitable size on it (10 cm × 11 cm).
3. Divide this rectangle into unit squares.
4. Fix a thermocol ball in each square using a pin as shown in the Fig. 1.
5. Enclose the balls as shown in the figure.

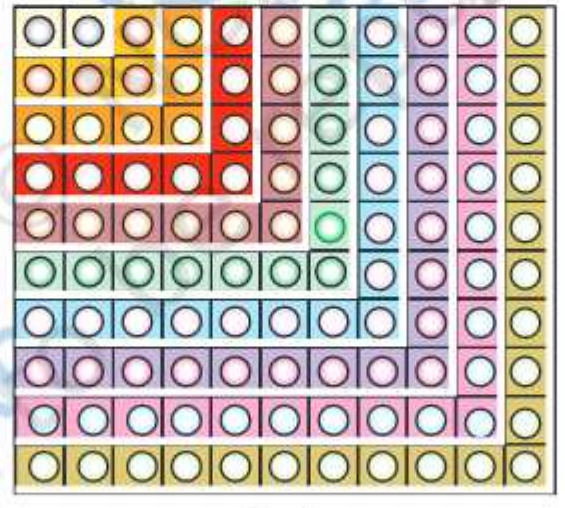


Fig. 1

Demonstration

Starting from the uppermost left corner,

the number of balls in first enclosure = 2 (= 1 ×2),

the number of balls in first two enclosures = 2 + 4 = 6 (= 2 ×3),

the number of balls in first three enclosures = 2 + 4 + 6 = 12 (= 3 ×4),

⋮

the number of balls in first six enclosures = 2 + 4 + 6 + 8 + 10 + 12 = 42 (= 6 × 7)

the number of balls in first ten enclosures = 2 +4 + 6 + 8 + ... + 20 = 110 (=10 × 11)

This gives the sum of first ten even natural numbers.

This result can be generalised for the sum of first n even natural numbers as

$S_n = 2 + 4 + 6 + ... + 2n = n \times (n + 1)$ (1)

OBSERVATION

For $n = 4$ in (1), S_n = ...

For $n = 7$ in (1), S_n = ...

For $n = 40$ in (1), S_n = ...

For $n = 70$ in (1), S_n = ...

For $n = 100$ in (1), S_n = ...

APPLICATION

The formula $S_n = n\ (n+1)$ is useful in finding out the sum of the first n even numbers.

Activity 9

OBJECTIVE

To establish a formula for the sum of first n terms of an Arithmetic Progression.

MATERIAL REQUIRED

Cardboard, coloured drawing sheets, white paper, cutter, adhesive.

METHOD OF CONSTRUCTION

1. Take a rectangular cardboard of a convenient size and paste a white paper on it. Draw a rectangle ABCD of length $(2a+9d)$ units and breadth 10 units.
2. Make some rectangular strips of equal length a units and breadth one unit and some strips of length d units and breadth 1 unit, using coloured drawing sheets.
3. Arrange/paste these strips on the rectangle ABCD as shown in Fig. 1.

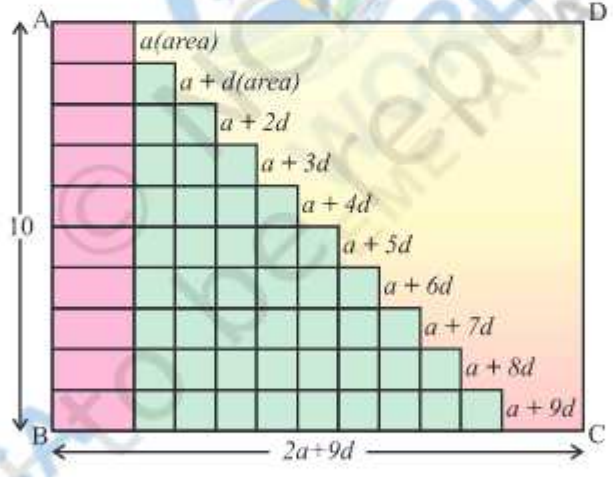


Fig. 1

DEMONSTRATION

1. The strips so arranged look like a stair case.
2. The first stair is of length a units, the second stair is of length $a+d$ (units), third of $a+2d$ units and so on and each is of breadth 1 unit. So, the areas (in sq. units) of these strips are a, $a + d$, $a + 2d$, ..., $a+9d$, respectively.

3. This arrangement of strips gives a pattern a, $a + d$, $a + 2d$, $a + 3d$, ...
   which is an AP with first term a and the common difference d.
4. The sum of the areas (in square units) of these strips
   $= a + (a + d) + (a + 2d) + ... + (a + 9d) = 10a + 45d$ (1)
5. Area of the designed formed by the stair case $= \frac{1}{2}$ (area of rectangle ABCD)

   $= \frac{1}{2}(10)(2a+9d)$

   $= (10a + 45d)$, which is the same as obtained in (1) above.

   This shows that the sum of first 10 terms of the AP $= \frac{1}{2}(10)(2a+9d)$

   $= \frac{1}{2}(10)\,[2a+(10-1)d]$

   This can be further generalised to find the sum of first n terms of an AP as

   $S_n = \frac{n}{2}\,[2a+(n-1)d\,]$

OBSERVATION

On actual measurement:

a = ---------, d = ----------, n = --------- S_n = ----------

So, $S_n = \frac{n}{2}\,[\,-+(n-1)-\,]$.

APPLICATION

This result may be used to find the sum of first n terms of the list of numbers :

1. $1^2, 2^2, 3^2, ...$ 2. $1^3, 2^3, 3^3, ...$

   to be studied in Class XI.

Activity 10

Objective

To verify the distance formula by graphical method.

Material Required

Cardboard, chart paper, graph paper, glue, pen/pencil and ruler.

Method of Construction

1. Paste a chart paper on a cardboard of a convenient size.
2. Paste the graph paper on the chart paper.
3. Draw the axes X′OX and Y′OY on the graph paper [see Fig. 1].
4. Take two points A(a, b) and B(c,d) on the graph paper and join them to get a line segment AB [see Fig. 2].

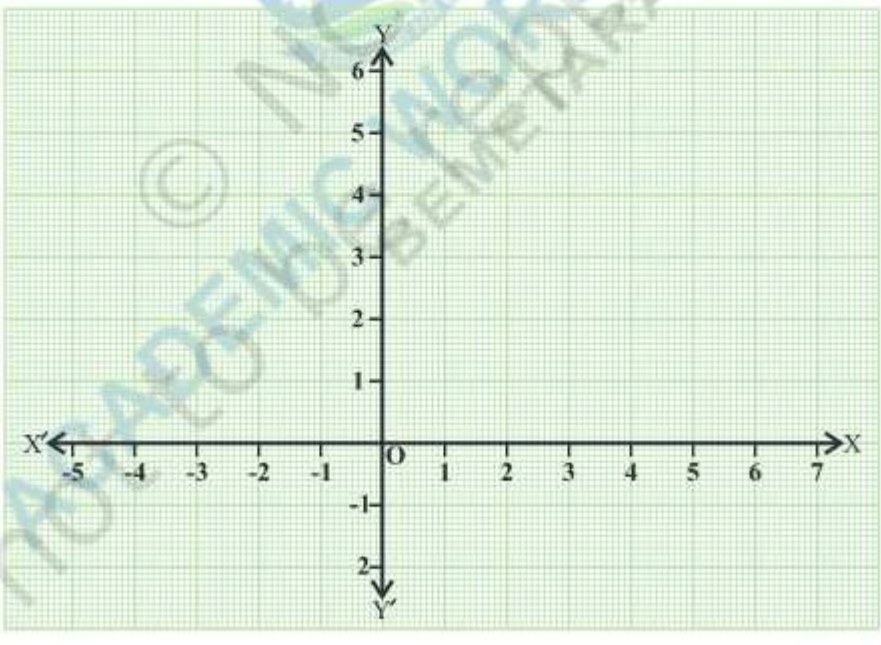


Fig. 1

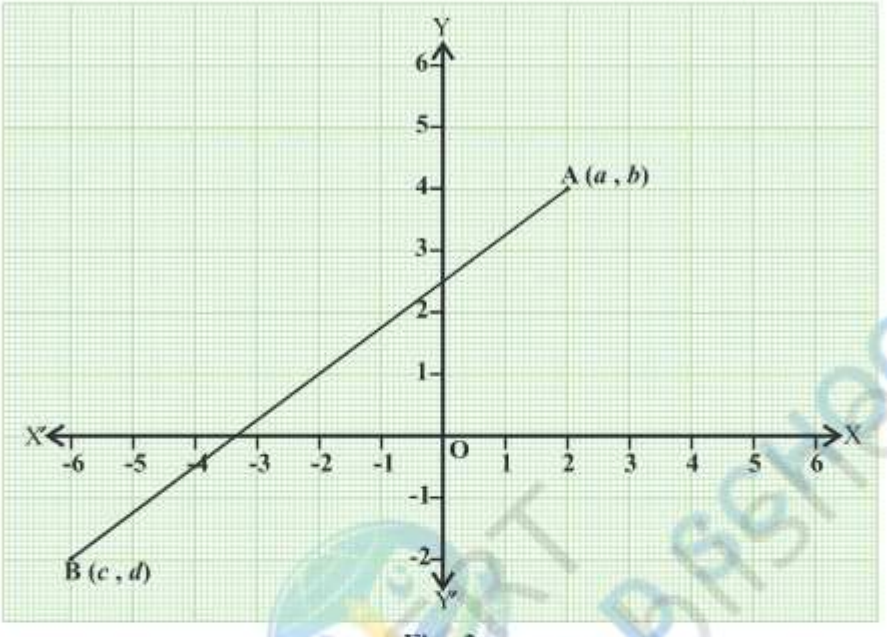


Fig. 2

Demonstration

1. Calculate the distance AB using distance formula.
2. Measure the distance between the two points A and B using a ruler.
3. The distance calculated by distance formula and distance measured by the ruler are the same.

Observation

1. Coordinates of the point A are _____.

   Coordinates of the point B are _____.
2. Distance AB, using distance formula is _____.
3. Actual distance AB measured by ruler is _____.
4. The distance calculated in (2) and actual distance measured in (3) are ____.

Application

The distance formula is used in proving a number of results in geometry.

ACADEMIC WORLD SCHOOL™
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SESSION: 2023-24
SUMMER VACATION ASSIGNMENT
CLASS: X

General Instructions:

1. Write in a clear and legible handwriting.
2. Complete all the homework in a separate subject Summer Vacation Homework Notebook.
3. **DO NOT COPY AND PASTE FROM THE INTERNET**. (Assignment will be rejected)
4. In case of reference from the internet, you may:
   A. Read the content from the internet, if you wish and paraphrase (Rewrite in your own words)
   B. Mention the source of your information by providing the link from the internet for the verification by the teachers.
5. Marks awarded will be counted in the final scores at the end of the session.
6. The Summer Vacation HW will be submitted immediately upon arrival to school after Summer Vacation.
7. For any assignment related query do post your question on E-Mail Id of respective subject teacher. List of Subject Teacher's E-Mail ID attached.

Note for the Parents:

Parents are requested to guide his/her wards to complete their assignments honestly and submit by the due date.

Class-X

Subject: Artificial Intelligence (417)

1. Create a video of your Chatbot and send it to your subject teacher's mail id.
2. Write ten points and explain the Applications of AI in the field Robotics.
3. Write a program of the following:
    a) Input age in years and print in days and months.
    b) Input two numbers a and b and print a^b.
    c) Input in minutes and print it in seconds.
4. Create a report on any one of the SDGs in the form of 4W canvas and prepare an AI Project Cycle mentioning all the stages in details.
5. Collect the past data (Affected, Recovered and Death Rate) of Covid Cases in different districts of Chhattisgarh (2019, 2020 and 2021) and maintain the record in any spreadsheet software. Also create a suitable chart or graph to analyze the data through a graphical representation.

Note: Do Question Number 2, 3 and 4 in your AI notebook and send the result of Question Number 1 and 5 to your Subject Teacher's mail id.

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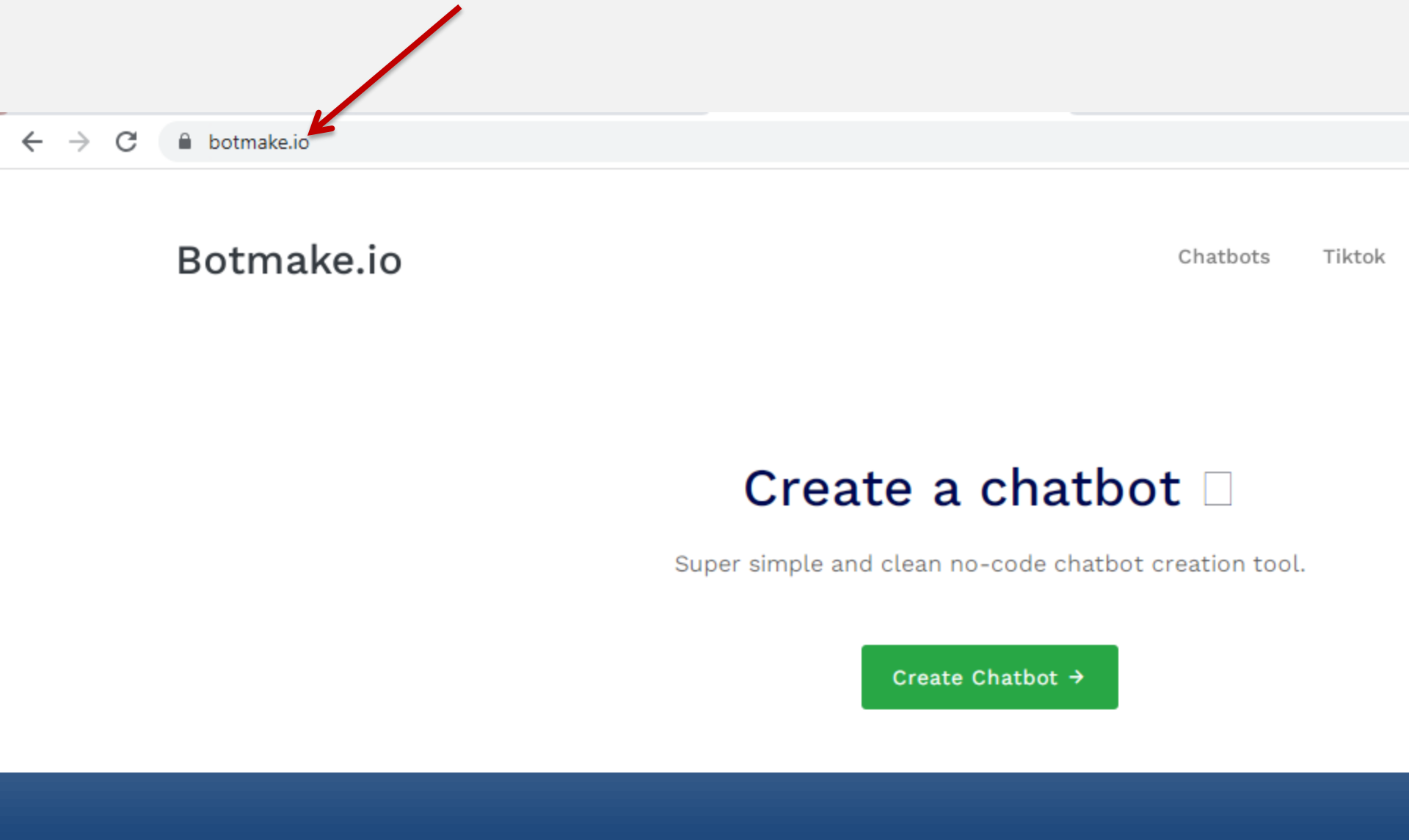
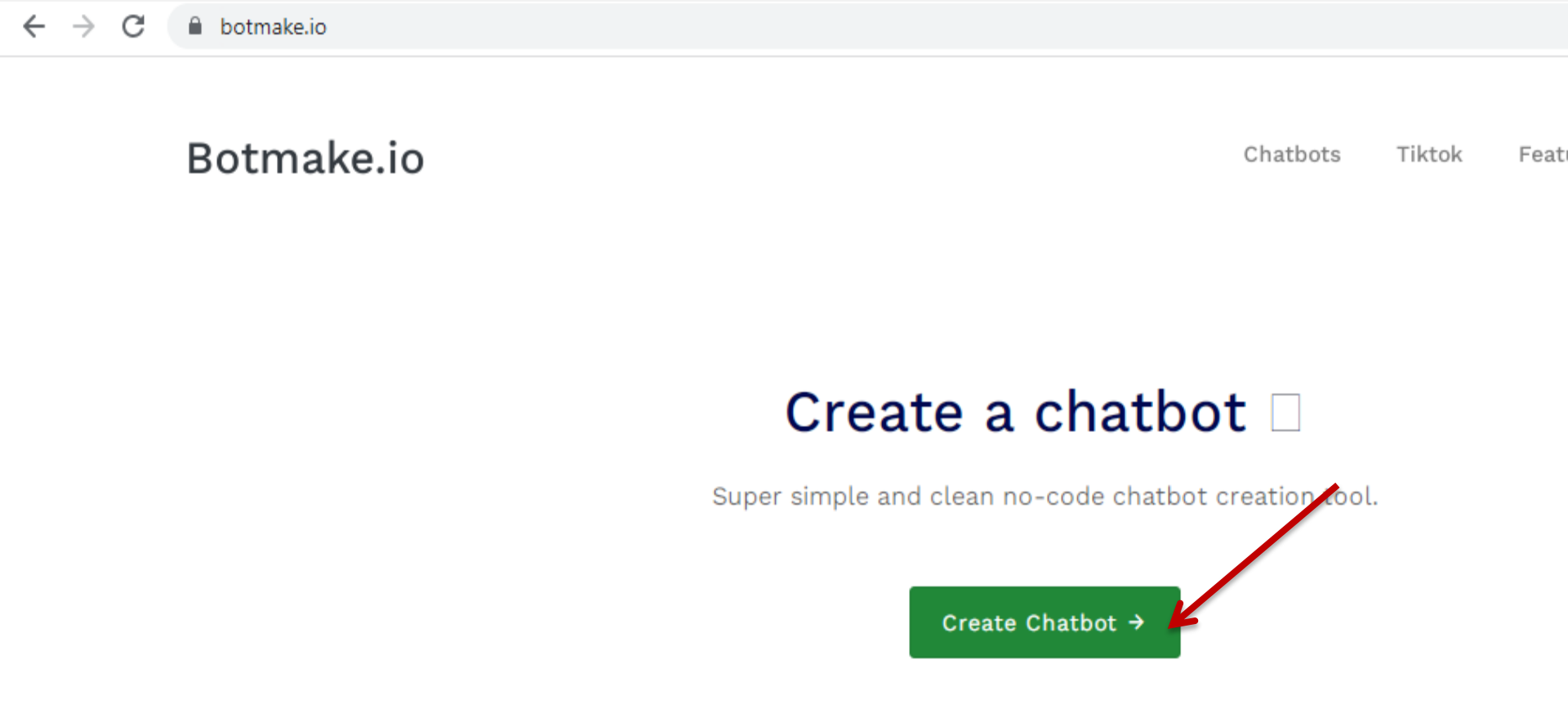
GUIDELINES TO PREPARE YOUR OWN CHATBOT

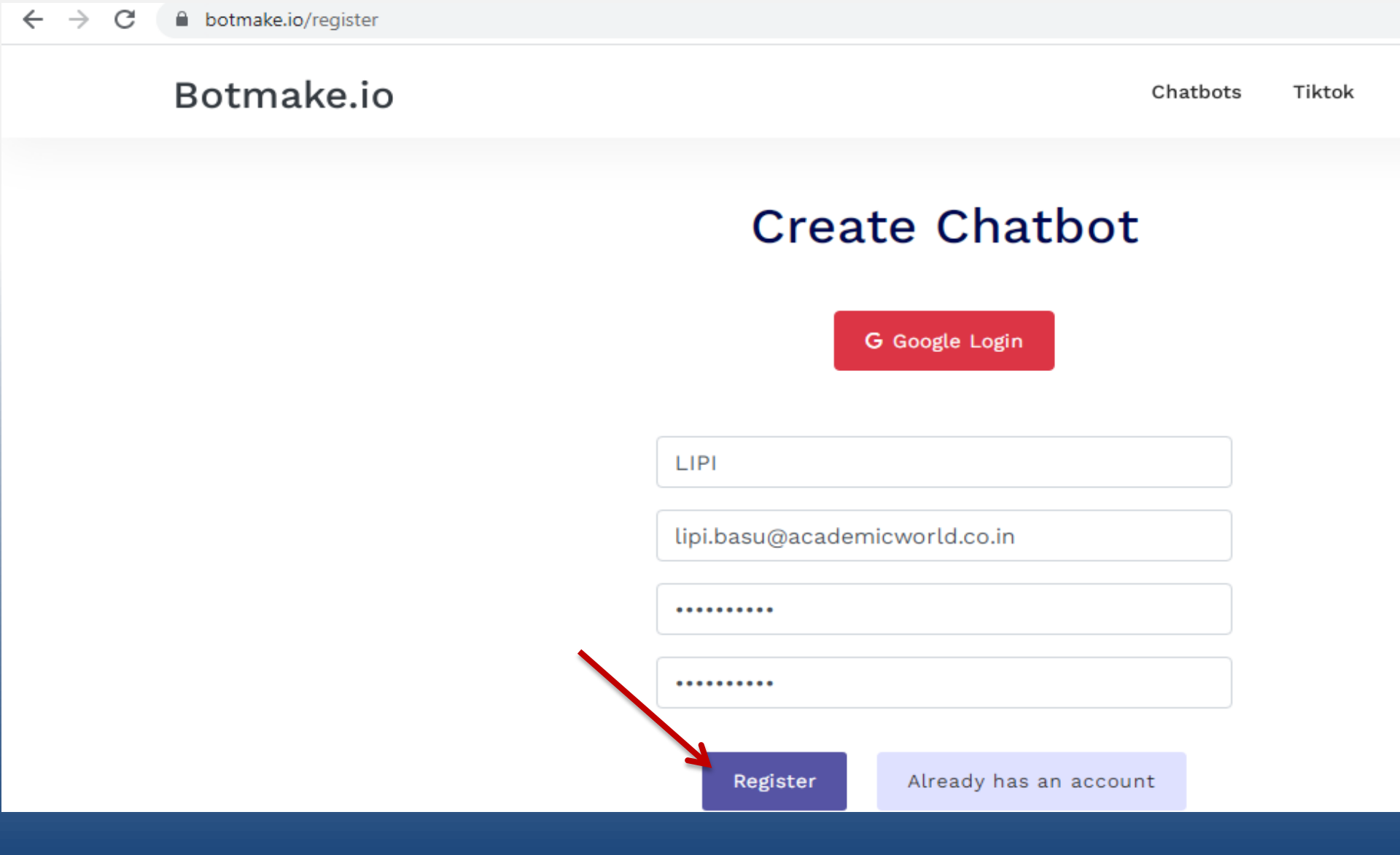
GO TO BOTMAKE.IO WEBSITE



CLICK ON CREATE CHATBOT



FILL THE EMPTY FIELDS AND CLICK ON REGISTER



Verify Email

Before proceeding, please check your email **lipi.basu@academicworld.co.in** for a verification link. If you did not receive the email, click here to request another.

Sign Out

GO TO YOUR MAILBOX AND CLICK ON VERIFY EMAIL ADDRESS

Botmake **Verify Email Address** - Botmake.io Hello! Please click the button below to verif...

Botmake <hello@botmake.io>
to me

10:35 AM (3 minutes ago)

Botmake.io

Hello!

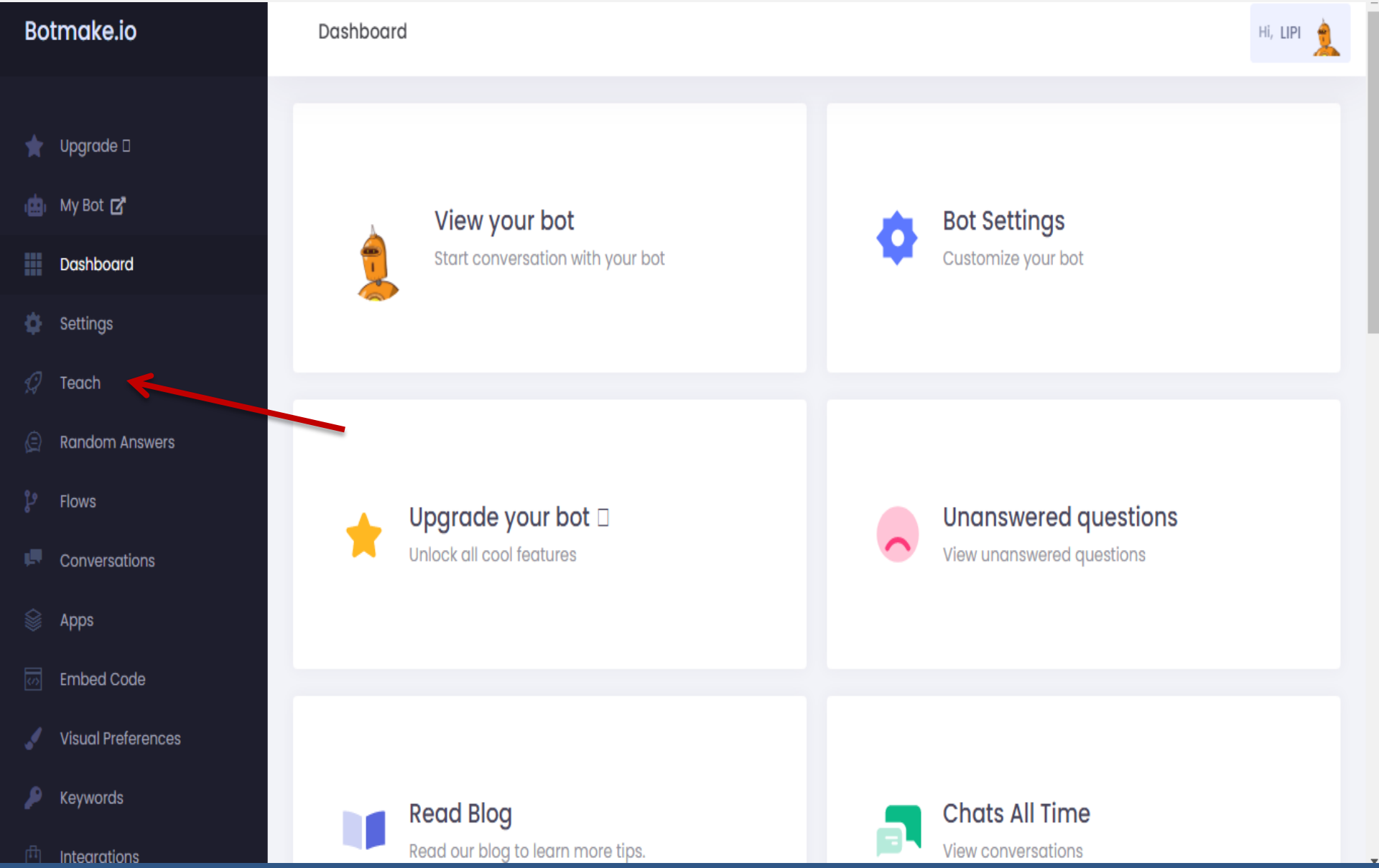
Please click the button below to verify your email address.

Verify Email Address

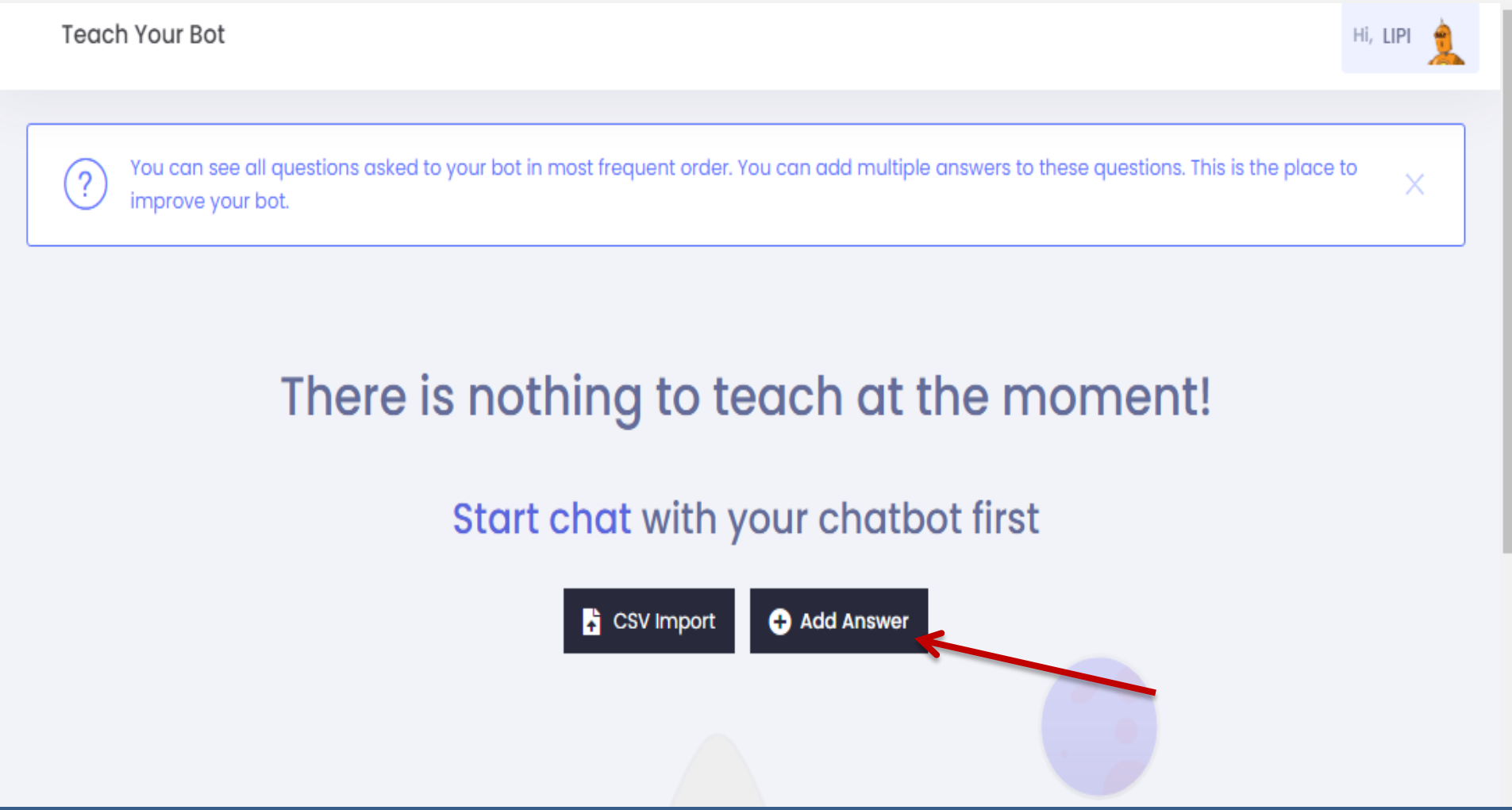
If you did not create an account, no further action is required.

Regards,
Botmake.io

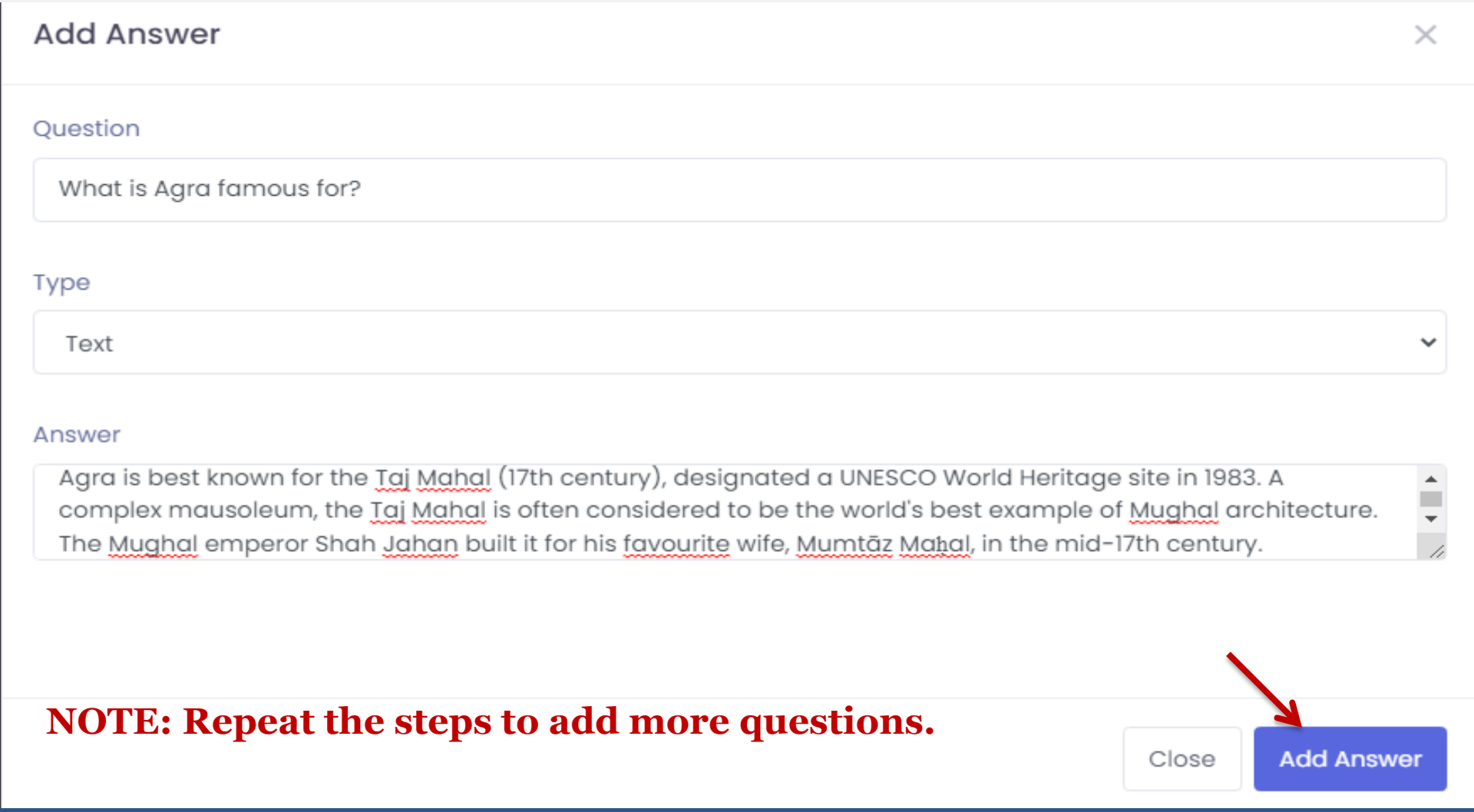
CLICK ON TEACH



CLICK ON ADD ANSWER



WRITE THE QUESTION AND ANSWER AND CLICK ON ADD ANSWER



NOTE: Repeat the steps to add more questions.

Teach Your Bot

Hi, LIPI

You can see all questions asked to your bot in most frequent order. You can add multiple answers to these questions. This is the place to improve your bot.

Show All | Unanswered | Answered

Search question

Order by frequency

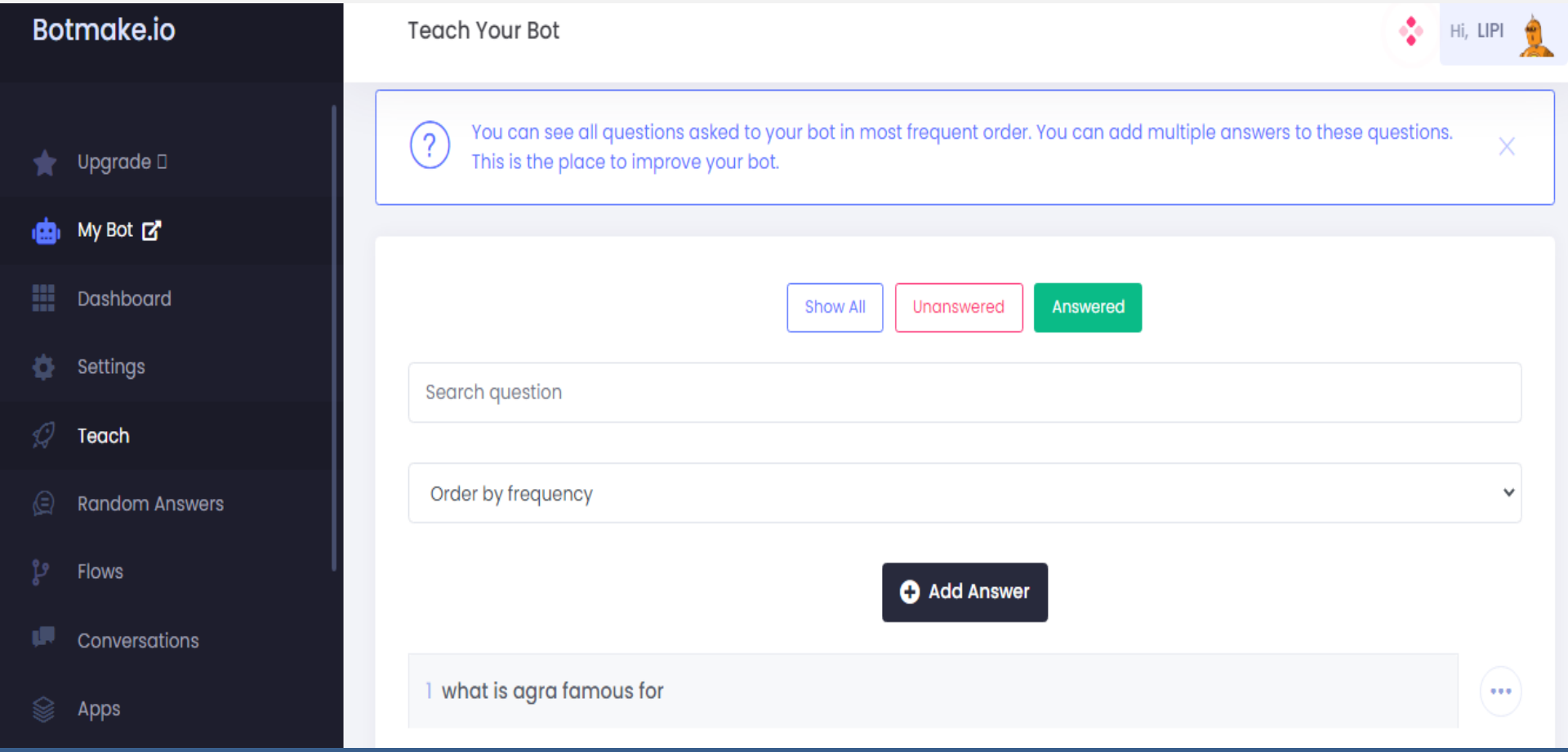
Add Answer

1 what is agra famous for

NOTE: Added Questions will appear in this section.

CSV Export | CSV Import

CLICK ON MY BOT



Edit Chatbot | View As Guest

TYPE YOUR QUESTION AND SEE THE RESULT

Hey □

Edit greeting message

What is agra famous for?

Add answer

Agra is best known for the Taj Mahal (17th century), designated a UNESCO World Heritage site in 1983. A complex mausoleum, the Taj Mahal is often considered to be the world's best example of Mughal architecture. The Mughal emperor Shah Jahan built it for his favourite wife, Mumtāz Maḥal, in the mid-17th century.

Edit answer

Type here and press <enter>...