

I Preliminary Information

- ① Name of the student : Lavanya
- ② class : 9 E.M
- ③ Roll.No : 10
- ④ Name of the lesson/unit : Real numbers

II Detailed information of the project

1. Title of the project :

Identifying square and ~~rect~~ rectangular shaped objects in daily life and verifying their lengths of diagonals are rational/irrational numbers.

② Objectives of the project:

* Identifying square and rectangular shaped objects in our daily life.

* Calculating the length of diagonals with suitable formulae.

* Check the length of diagonals rational or irrational numbers.

③ Materials used : Pen, pencil, measuring tape, scale, eraser

④ Tools : (i) collection of information

I collected information regarding to dimensions of square and rectangular shaped objects.

(ii) Calculation :

I calculated the diagonal of square shaped object with the formula $d = a\sqrt{2}$, where 'a' is the side.

I calculated the diagonal of a rectangular shaped object with the formula $d = \sqrt{l^2 + b^2}$, where 'l' is length, 'b' is breadth.

(iii) Analysis :

I analyse length of diagonal is a rational/irrational based on number properties.

⑤ Procedure :

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Collection of data :

S.No.	Object	Shape	Dimensions		
			Length	Breadth	Side
1.	Dining table	Rectangle	12 ft	5 ft	-
2.	Window	square	-	-	2 ft
3.	Writing pad	Rectangle	3 ft	2 ft	-
4.	Clock	square	1 ft	-	-
5.	Black board	Rectangle	8 ft	6 ft	-
6.	Floor of the class room	Rectangle	10 ft	7 ft	-

Process :-

* Lengths of all dimensions are called in 'feet' and fractional value of length are rounded off to nearer integer

* I calculated the length of diagonal of square using $d = a\sqrt{2}$ and rectangle using $d = \sqrt{l^2 + b^2}$ formulae.

Problem solving :-

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S.No	Object	Shape	Diagonal
1.	Dining table	Rectangle	$d = \sqrt{l^2 + b^2} = \sqrt{12^2 + 5^2}$ $= \sqrt{169}$ $= 13 \text{ ft.}$
2.	Window	square	$d = a\sqrt{2} = 2\sqrt{2} \text{ ft}$
3.	Writing pad	Rectangle	$d = \sqrt{3^2 + 2^2} = \sqrt{13} \text{ ft}$
4.	clock	square	$d = 1\sqrt{2} = \sqrt{2} \text{ ft}$
5.	Black board	rectangle	$d = \sqrt{8^2 + 6^2} = \sqrt{100} = 10 \text{ ft}$
6.	Floor of class room	rectangle	$d = \sqrt{10^2 + 7^2} = \sqrt{149} \text{ ft}$

Analysis:-

From the properties of numbers we can analyse the length of diagonal is rational or irrational number

S.NO	Object	Diagonal	Rational/ Irrational
1.	Dining table	13 feet	Rational
2.	Window	$2\sqrt{2}$ feet	Irrational
3.	writing pad	$\sqrt{13}$ feet	Irrational
4.	clock	$\sqrt{2}$ feet	Irrational
5.	Black board	10 feet	Rational
6.	Floor of class room	$\sqrt{149}$ feet	Irrational

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Conclusion:-

* From this project, I came to know that dining table, black board have diagonals as rational numbers and window, writing pad, clock, floor of class room have diagonals as irrational numbers

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* Diagonals of square shaped objects have always irrational numbers.

Experiences of the student:

I used scale to measure lengths of objects but it is difficult to measure larger shapes like floor of the room using scale. In that case I used measuring tape.

Doubts and questions:-

It is difficult to find dimensions of small objects which is less than 1 foot. In such cases can I use other units 'cms', 'inches' instead of feet?

Acknowledgement:

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I convey my sincere thanks to who are cooperate and putting their earnest efforts in completing the project.

Reference books

1. class - IX Mathematics text book
2. NCERT, text Books

Signature of the student :