ALTERNATE ACADEMIC CALENDER-2020-21

Standard:8th Month: September Subject: Mathematics

Understanding Quadrilaterals

Sl. no	Month/ week	Expected learning outcome	Teaching-Learning activity	Evaluation
1	September 1st week	1. Point, line segment, Plane surface and plane curved	Recalling the concept of point, line segment, plane. Surface and curved surface by observing and remembering the things used in day-to-day life. https://youtu.be/GzhTWB-o37c	Activity sheet-1
2		Meaning of Polygon. Curves that are polygon and curves that are not polygon	Explaining the polygon with some examples. And also classifying them into curves forming polygon and which does not polygon.	Activity sheet-1
3		Classification of Polygon and diagonals of Polygon.	Explaining the classification of polygon with some examples Diagonals in polygon is explained by some examples.	Activity sheet -2 & 3
4		Convex and concave polygons	Differentiating convex and concave polygons using some examples.	Activity sheet-4
5		Regular and Irregular polygons	By giving some examples to regular and irregular polygon and differentiating them.	Activity sheet-5
6		Angle some property of Polygons	Explaining this by some examples.	*Activity Sheet 6 & 7*
7		Sum of the measures of the exterior angles of a polygon is 360^0.	Explaining the sum of exterior angles of the polygon is 360^0 By solving some problems. https://youtu.be/EVACu9h0u6o	Activity-7

Sl. no	Month/ week	Expected learning outcome	Teaching-Learning activity	Evaluation
8	September 2nd week	Kinds of Quadrilaterals	A flow chart is used to explain the types of quadrilaterals. https://youtu.be/hvbQPl_zvnI	Activity Sheet-8
9		Properties of quadrilaterals.	Explaining the features types of quadrilaterals and also finding differences between the types of quadrilaterals using flow chart. https://youtu.be/_PWsSLJUAbQ	Activity Sheet-9,10 &11
10		Solving problems on parallelogram Rhombus and other Quadrilaterals.	Solving and explaining the problems on types of quadrilaterals.	Activity sheet-12,13
11		Differentiating kite and rhombus and solving some problems on it	By observing the diagram of rhombus and kite listing the differences between both.	Activity Sheet-14
12		Area and perimeter of square and rectangle.	Comparing the characteristics of Square and rectangle using diagrams and solving some problems on perimeter and area of the both.	Activity Sheet-15

Standard:8th Month: September Subject: Mathematics

Square Numbers and Square Roots

Sl. no	Month/ week	Expected learning outcome	Teaching-Learning activity	Evaluation
1	September 3rd week	Concept of square number	By giving worksheet the following properties of square numbers can be explained	Activity Sheet-16
2		Properties of Square numbers	❖ Square numbers do not have the digits 2,4,7 or 8 in its unit place. ❖ Relation between number of zeros at the end of the number and the number of zeros at the ends of its square. ❖ Square of even numbers and odd numbers are always even and odd respectively. https://www.youtube.com/watch?v=E9J7zyfO9zw	Activity Sheet-15 Activity Sheet-17 Suvega-1 Page no.40,41
3		• Adding triangular numbers • Numbers between square numbers	• With the help of some example triangular numbers are explained. Finding number between Square numbers	Activity sheet-18 Suvega-1 Page no-39,41&43
4		Adding odd numbers.	Sum of first n odd numbers is n^2 Example: $1+3=4=2^2$	Activity 19 Suvega 45, 46
5		A sum of consecutive natural numbers	Square of any odd number can be expressed as the sum of two consecutive positive integers. Example: $3^2=9=4+5$	
6		Some more patterns in square number	This can be explained by showing a chart of square number pattern and related videos to it	Activity sheet -20
7		Pythagorean triplets	Ask students to find square of a number without multiplication. By activity, Pythagorean triplets	Activity sheet 21 Suvega- 42

Sl. no	Month/ week	Expected learning outcome	Teaching-Learning activity	Evaluation
8		Introduction for Square root	Square root explained using example. Completing table of square roots. https://www.youtube.com/watch?v=zYPl6VbQZU	Activity sheet 22 Suvega 44,45
9	September 4th week	Finding Square root by prime factorisation method	Finding square root by prime factorisation by using example. Some of video related to it is used to explain finding square root by prime factorisation	
10		Finding the smallest number which can be multiple or divide the given number to get a square number.	The steps to be followed to find square root by division method can be explained by using example.	Activity sheet 24 Suvega Page no 43
11		Finding square root through repeated subtraction	Finding square root through by repeated subtraction is explained by solving exercise problem.	Activity sheet 25
12		Division method to finding square root for the given number.	By using flash card, explaining the square root of decimal number	Activity sheet 26
14		Square root of decimals		

Class:8 Activity Sheet-1

1) Say true or false for the following sentence:

a) Surface of a ball represents the plane surface, ☐

b) A straight is smaller than line segment. ☐

c) The sun rays are an example for a straight line. ☐

d)Surface of the table represent the plane surface. ☐

2) Which of the following refers to a point, a line segment and a plane surface.

a) Edge of a measuring scale _____

b) Surface of water in a bucket _____

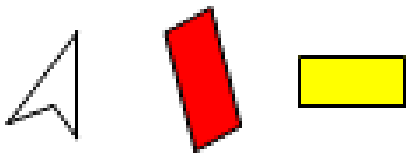
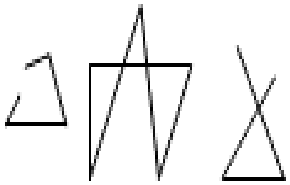
c) Edge of a geometrical instrument box_____

d) Floor of the house_____

e) Sharp tip of the compass _____

POLYGONS:

A simple closed curve made up of only line segments is called a Polygon.

Curve that are polygons	Curves that are not polygons
	

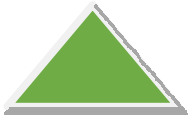
Give 3 example for Polygon and Non polygon curves

Polygons curves	Non-Polygon curves

Class:8 Activity Sheet-2

Classification of Polygons:

Depending upon the number of sides and points of polygons are named. Name the polygon, number of sides and draw its diagram in the following table.

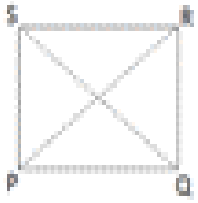
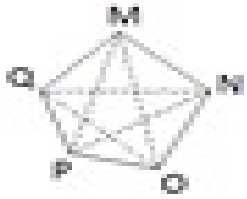
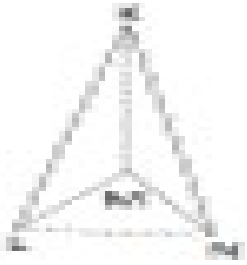
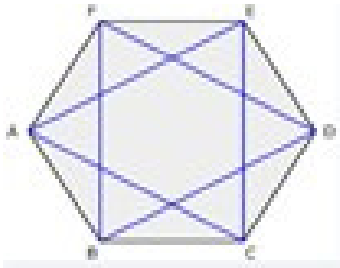
Sl.no.	Model	Name of the Polygon	Number of sides/ vertices
1		Triangle	3
2			
3			
4			
5		Heptagon	
6		Octagon	
7		Nonagon	
8		Decagon	

Class:8th Activity Sheet-3

Diagonals:

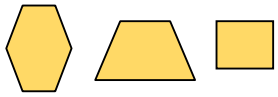
The line segment joining opposite vertices of the polygon is called as diagonal.

Complete the table follow the example.

Sl.no.	Diagram	Diagonal
1		$\overline{PR}$&$\overline{QS}$
2		
3		
4		

Class:8th Activity Sheet-4

Convex polygon and concave polygons:

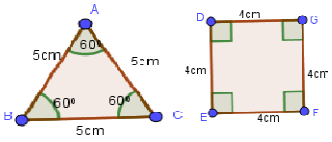
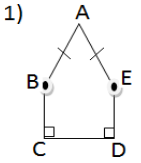
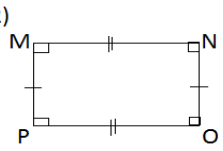
Convex polygon	Concave polygon
Any line segment joining any two different points in the interior of the polygon, lies wholly in the interior of the polygon. Such polygon are known as convex polygon. 	Any line segment joining any two different points in the interior of the polygon, some of it lies interior and some other are to the exterior. Such polygon is called as concave polygon.

Draw 5 figures for convex and concave polygons.

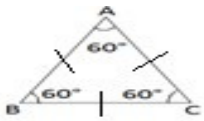
Class:8th

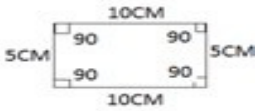
Activity sheet-5

Regular and Irregular polygons

Regular polygon	Irregular polygon
Polygons with equiangular and equilateral are called as regular polygon. 	Polygons with unequal sides and unequal angles are called as irregul ar polygon.  

Classify the following into regular and irregular polygon:





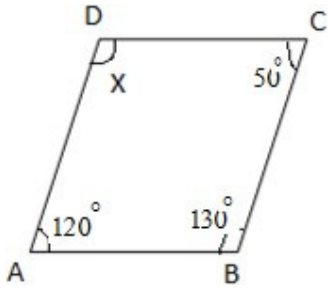
Regular polygon	Irregular polygon

Class:8th Activity Sheet-6

Sum of the interior angles of the polygon

Example:

1. Find the value of X in the given figure.



Sol: $\angle A + \angle B + \angle C + \angle D = 360^0$

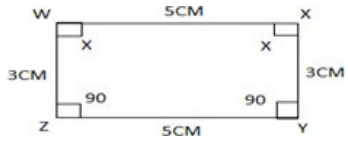
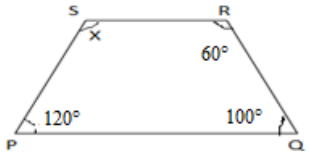
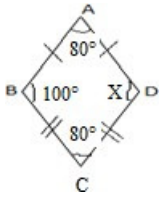
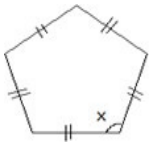
$120^0 + 130^0 + 50^0 + X = 360^0$

$300^0 + X = 360^0$

$X = 360^0 - 300^0$

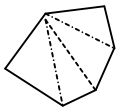
$X = 60^0$

2. Find the value of x in the following figure.

Class:8th Activity Sheet-7

Observe the given table, divide each polygon into triangles using it state sum of interior angles.

Polygon				
No. of sides	3	4	5	6
Sum of interior angle	$1X\ 180^0=180^0$ $(3-2)180^0=180^0$	$2X\ 180^0=$ $(4-2)180^0=$		

Sum of exterior angles of a polygon is 360^0

Example: Find the value of x in the given figure.

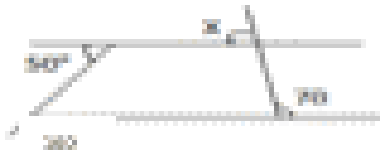
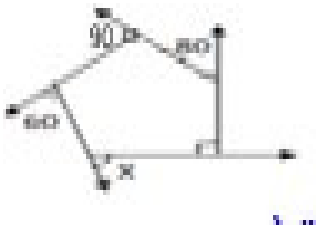
Solution: $x+90^0+50^0+110^0=360^0$

$x+250^0=360^0$

$x=360^0-250^0$

$x=110^0$

Find the value of x in the following figure.

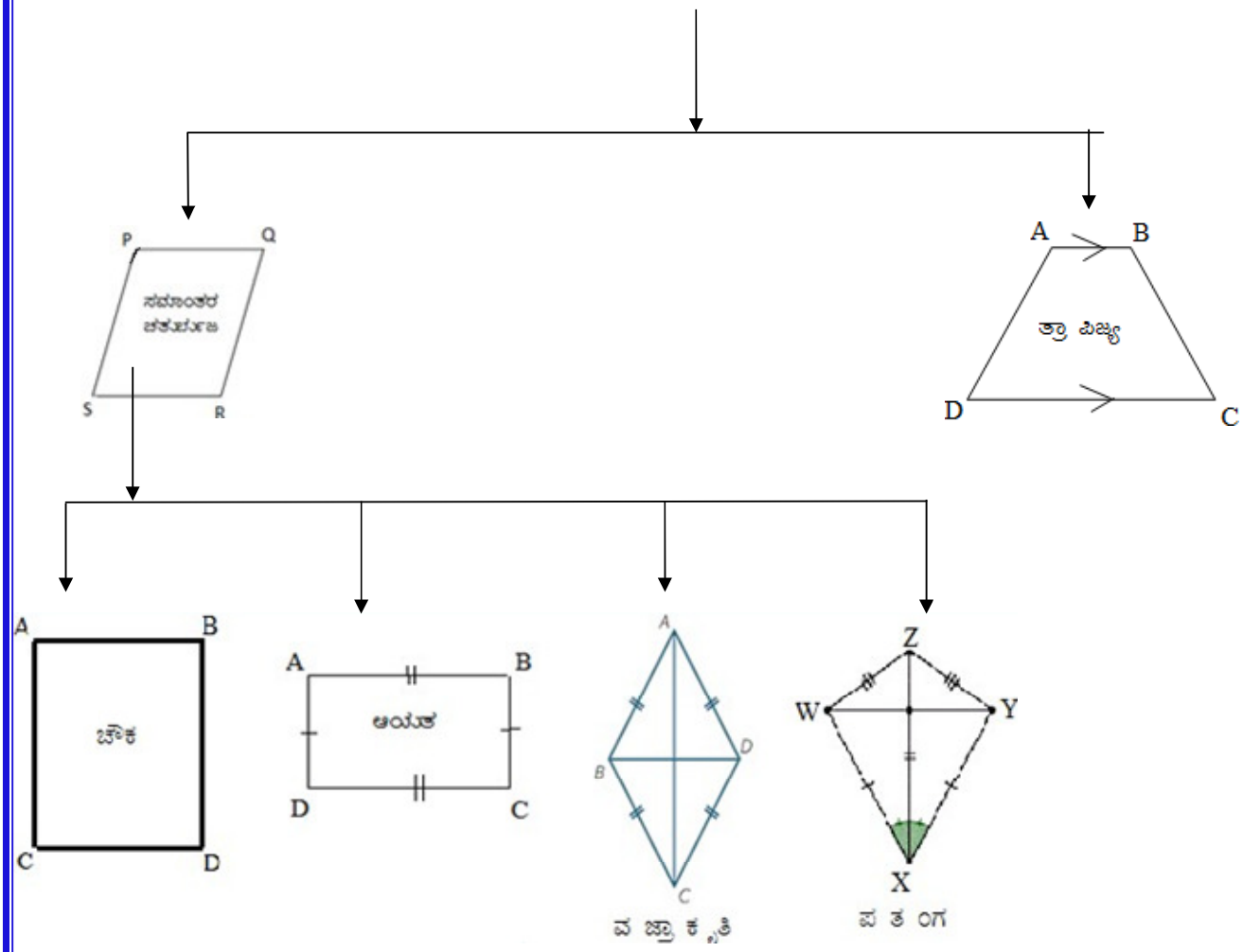
1. 	
2. 	

Class:8th Activity Sheet-8

Types of quadrilaterals:

Quadrilaterals are classified on sides and angles; hence they have different names accordingly.

Flow chart of Quadrilateral



By comparing the relation between first two write the fouth term in relation with third term:

1.Square: Rhombus ::Rectangle : _____

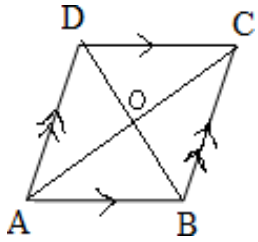
2.Triangle: No. of diagonals 0::Regular hexagon:_____

3. Sum of interior angles of a quadrilateral: 360^0::Sum of exterior angles of a Polygon:_____

Class:8th Activity Sheet_9

Parallelogram

- Opposite sides are parallel
  $AB \parallel DC$ and $AD \parallel BC$
- Opposite side are equal and
  opposite angles are equal. $AB = DC, AD = BC$
  $\angle BAC = \angle DCB, \quad \angle ABC = \angle ADC$
- Diagonal bisect each other.
  AO=OC, BO=OD

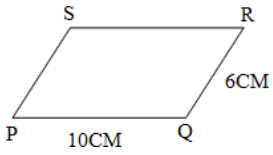


Example1 Find the Perimeter of the parallelogram PQRS as in figure.

Solution: In a parallelogram opposite sides are equal.

$\therefore$ PQ=RS=10 cm

PS= QR=6cm



Perimeter of the parallelogram PQRS= PQ+PS+QR+RS

=10+6+6+10

=32cm

Example: BEST is a parallelogram then find angle x, y and z from the given figure.

Solution: BEST is a parallelogram, and the opposite angles of it are equal.

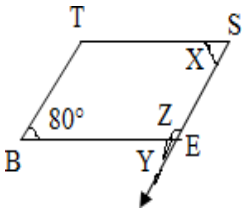
$\therefore \angle B = \angle S = 80^0$

$\angle E = \angle T$

Sum of adjacent angle $=180^0$

$\angle B + \angle E = 180^0$

$80^0 + \angle E = 180$ $\quad \angle E = 180^0 - 80^0$ $\quad \angle E = 100^0 = z$



$z + y = 180^0$

$100^0 + y = 180^0$

$Y = 180^0 - 100^0$

$Y = 80^0$

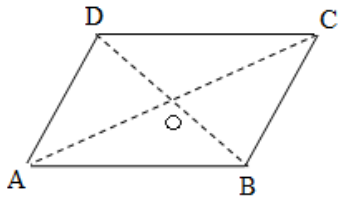
Class:8th Activity Sheet-10

1. Using the given parallelogram ABCD as given, complete the following statement.

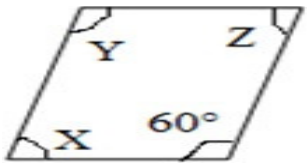
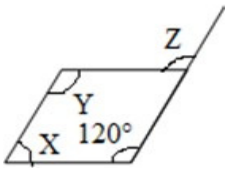
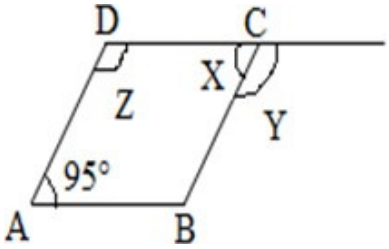
1. AD =_____

2.

3.OC=_____



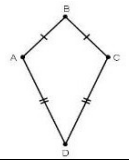
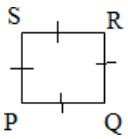
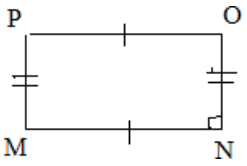
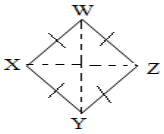
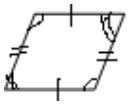
2. Find the angles x,y,z in the following parallelogram.

1. 	2.
3. 	4. 

Class:8th Activity Sheet-11

1. Draw a diagram of a parallelogram which has equal opposite angles.

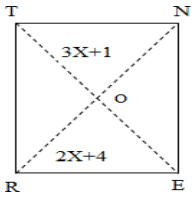
2. Complete the following table. Write the name of the quadrilateral and its properties.

Sl.No.	Quadrilateral	Name	Property
1			
2			
3			
4			
5			

Class:8th Activity Sheeet-12

Example:

1. In a rectangle RENT diagonal intersects at o. If TE =3x+1 and RN=2x+4 then find the value of x.



Solution:

In a rectangle diagonal bisect each other.

Therefore, $\frac{TE}{2} = \frac{RN}{2}$

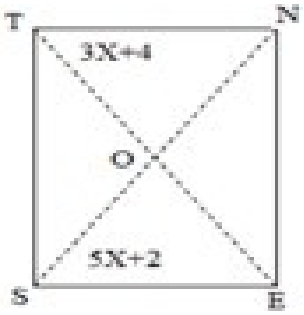
Hence, TE=RN

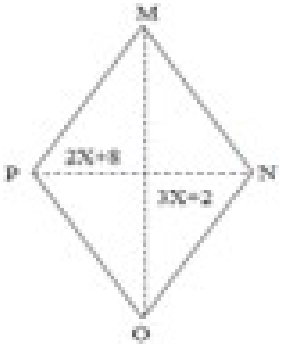
3x+1=2x+4

3x-2x=4-1

X =3

2.Find the value of x in the following figure.



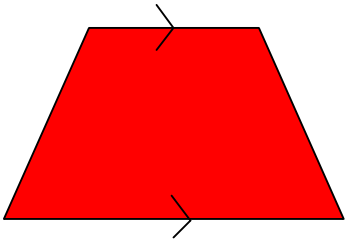


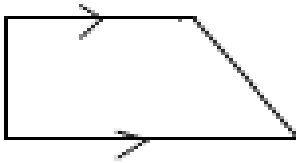
Class:8th

Activity Sheet-13

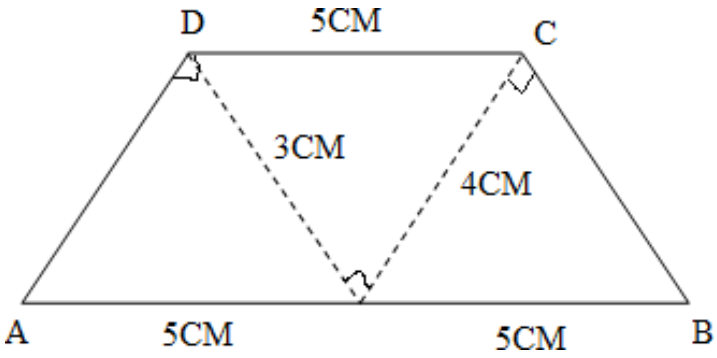
Trapezium

A quadrilateral having a pair of parallel lines is called as trapezium.





Try to do this: Construct three congruent triangles of measurement 3cm,4cm and 5cm. Cut them and arrange as show in the below figure. You will get a trapezium.

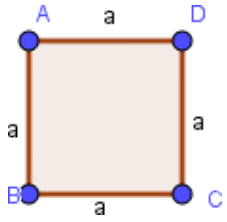
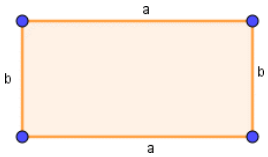


By observing above figure identify a pair of parallel lines. Check the measure of non-parallel sides. Are they equal? Do other two trapezium using same triangles.

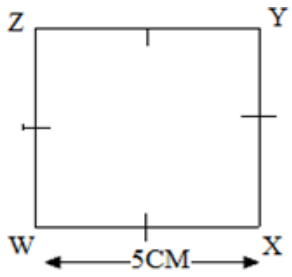
Class:8th Activity sheet-14

Square and Rectangle:

Know this:

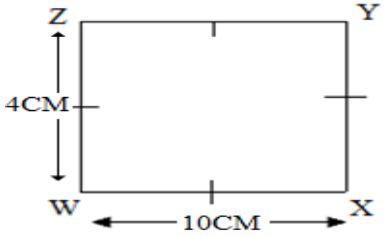
Figure	Perimeter	Area
 Square	4a	a^2
 Rectangle	2a+2b	aXb

1. Find the perimeter and area of the given square.

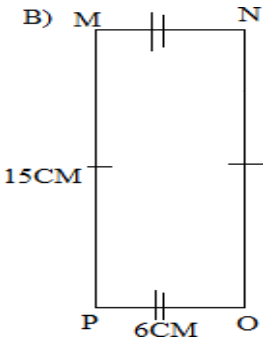


2. Find the perimeter of the following rectangle.

A)



B)



Class:8th Activity Sheet -15

1.Write the difference between the following:

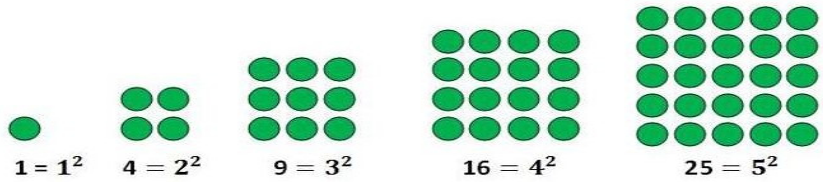
Square	Rhombus
Rectangle	Kite

Sl.No.	Learning Outcomes	I Know	I some of it	I Don't Know
1	Meaning of polygon, curved polygon curved non polygon.			
2	Classification of Polygons.			
3	Diagonals in polygon			
4	Convex and concave polygons.			
5	Regular and Irregular Polygons.			
6	Angle sum property of the polygons			
7	Angle sum property of exterior angles of polygons.			
8	Types of quadrilaterals			
9	Properties of types of quadrilaterals			
10	Properties of parallelogram			
11	Differences and similarities between rhombus and kite.			
12	Difference between square and a rectangle.			

Class:8th Activity Sheet-16

Square Numbers:

Product obtained by multiplying same number twice is called as square numbers. If n is a natural number, then its square is n x n=n^2



1. Complete the table:

Number	Square number	Number	Square Number	Number	Square number
1	1X1=1=1^2	11		21	
2	2X2=4=2^2	12		22	
3	3X3=9=3^2	13		23	
4	4X4=16=4^2	14		24	
5	5X5=25=5^2	15		25	
6	6X6=36=6^2	16		26	
7	7X7=49=7^2	17		27	
8	8X8=64=8^2	18		28	
9	9X9=81=9^2	19		29	
10	10X10=100=10^2	20		30	

2. Write the square numbers between the following numbers.

a) 30 and 50

b) 50 and 100

c) 100 and 150

d) 250 and 350

3. Find the square of, (I) 19^2 (ii) 24^2

Class:8TH Activity Sheet-17

Properties of square numbers:

1. The numbers 2,3,7 or 8 cannot be found in the unit place of square numbers.

Examples:

100, 81,144,225,576,529, are the square numbers. These numbers have 0,1,4,5,6or 9 in their unit place. In the numbers 22 43,97, 18 the unit place digits are 2, 3, 7 ,8 but these numbers are not square numbers.

2. If a number has n number of zeros at the end, then its square has 2n number of zeros.

Example:

10^2=100

100^2= 10000

2000^2= 4000000

Activity:1. Identify the unit place number in the following square number.

Sl. No.	Number	Unit place number
1	1234	
2	52698	
3	21222	

2. Identify whether the following numbers in the table are odd number square and even numbers

Sl. No.	Numbers	Answer
1	727	
2	1980	
3	2826	
4	7779	

3. Write number of zero in the Square of the following number.

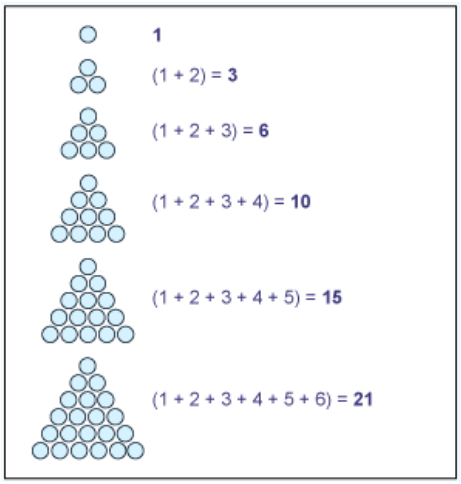
1	60	Number of zeros in their square is
2	400	Number of Zeros in their square is

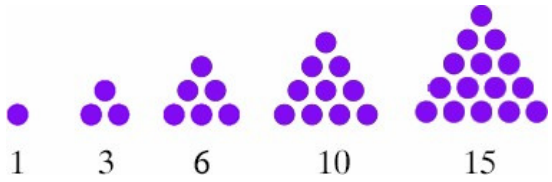
4. verify that the following numbers are perfect square or not. Give reason.

1	1057	
2	7928	
3	89722	

Class:8th Activity Sheet -18

Sum of Triangular number:





The numbers 1,3, 6,10,15,..... are called as triangular numbers.

Sum of any two consecutive triangular number gives a square number.

Example:

$1+3=4=2^2$

$3+6=9=3^2$

$6+10=16=4^2$

Numbers between square numbers.

There are 2n non-perfect square numbers between the squares of the numbers n and (n+1).

The number of non-perfect square between $1^2=1$ and $2^2=4$ is 2,3.

The number of non-perfect square between $2^2=4$ and $3^2=9$ is 5,6,7,8

Activity:

1. How many natural numbers are between the following square numbers:

(a) 12^2 and 13^2

(b) 25^2 and 26^2

2.List the number of non-perfect square numbers between the following numbers.

(a) 100^2 and 101^2

(b) 1000^2 and 1001^2

Sum of odd numbers:

Sum of first n odd number is n^2.

Sum of first one odd number	$1^2=1$
Sum of first two odd numbers	$1+3=4=2^2$
Sum of first three odd numbers	$1+3+5=9=3^2$
Sum of first four odd numbers	$1+3+5+7=16=4^2$
Sum of first five odd numbers	$1+3+5+7+9=25=5^2$
Sum of first six odd numbers	$1+3+5+7+9+11=36=6^2$

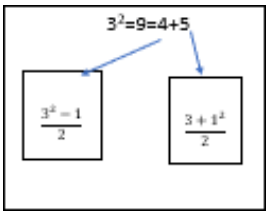
Sum of consecutive natural numbers.

We can represent square of any odd number as the sum of two consecutive natural numbers

Example:

$3^2=9=4+5$ $5^2=25=12+13$

$7^2=49=24+25$ $9^2=81=40+41$



Activity:

1. Without adding find the sum of the following:

(a) 1+3+5+7+9+11+13+15+17+19

.

(b) 1+3+7+9+11+13+15+17+19+21+23

2. Do as directed

(a) Represent 49 into the sum 7 odd numbers.

(b) Represent 121 into the sum of 11 odd numbers.

3. Represent the following into the sum of two consecutive integers.

(a) 11^2

(b) 19^2

Some more patterns of square numbers;

$1^2 = 1$
$11^2 = 121$
$111^2 = 12321$
$1111^2 = 1234321$
$11111^2 = 123454321$
$111111^2 = 12345654321$
$1111111^2 = 1234567654321$

$7^2 = 49$
$67^2 = 4489$
$667^2 = 444889$
$6667^2 = 4444889$
$66667^2 = 4444488889$
$666667^2 = 444444888889$

Using above table, find the value of the following.

11111111^2	
111111111^2	
6666667^2	
66666667^2	

Follow the below model and fill up the blanks.

$11^2 = 121$
$101^2 = 10201$
$1001^2 = 1002001$
10001^2 = ----------
100001^2 = ----------

Class:8th **Activity sheet -21**

Finding the square of the given numbers.

Without multiplying finding square of the given numbers.

(i) 39

$39^2 = (30+9)^2$

$= (30+9)(30+9)$

$= 30(30+9)+9(30+9)$

$= 900+270+270+81$

$= 1521$

(ii) 46

$46^2 = (40+6)^2$

$= (40+6)(40+6)$

$= 40(40+6)+6(40+6)$

$= 1600+240+240+36$

$= 2116$

Without multiplication find the square of the following.

(i) 63	(ii) 75	(iii) 86

Verify the following set of numbers are Pythagorean triplet or not.

(i) 5,12,13	(ii) 6,8,10	(iii) 7,8,12

Class:8th **Activity Sheet-22**

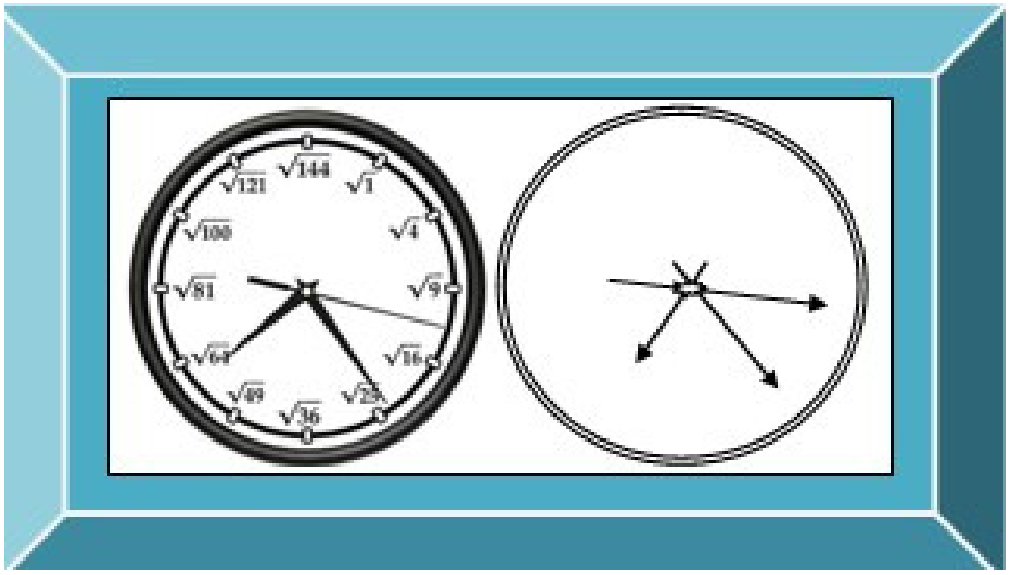
Square roots:

If m and n are two natural numbers and n can represent as $\sqrt{m}$ then n is said to be the square root of m.

1.Complete the following table.

1	$\sqrt{1}$ = 1	121	$\sqrt{\ }$ =		$\sqrt{\ }$ =21
4	$\sqrt{4}$ = 2	144	$\sqrt{\ }$ =		$\sqrt{\ }$ =22
9	$\sqrt{9}$ = 3	169	$\sqrt{\ }$ =		$\sqrt{\ }$ =23
16	$\sqrt{16}$ = 4	196	$\sqrt{\ }$ =		$\sqrt{\ }$ =24
25	$\sqrt{25}$ = 5	225	$\sqrt{\ }$ =		$\sqrt{\ }$ =25
36	$\sqrt{36}$ = 6	256	$\sqrt{\ }$ =		$\sqrt{\ }$ =26
49	$\sqrt{49}$ = 7	289	$\sqrt{\ }$ =		$\sqrt{\ }$ =27
64	$\sqrt{64}$ = 8	324	$\sqrt{\ }$ =		$\sqrt{\ }$ =28
81	$\sqrt{81}$ = 9	361	$\sqrt{\ }$ =		$\sqrt{\ }$ =29
100	$\sqrt{100}$ = 10	400	$\sqrt{\ }$ =		$\sqrt{\ }$ =30

2.Observe the first clock, find the roots of the numbers directed by the needles and write the respective roots in the second clock.



Class:8th Activity Sheet-23

Finding square roots by prime factorisation method.

1) find the square root of 324 by prime factorisation method.

2	324
2	162
3	81
3	27
3	9
3	3
	1

$324 = 2x2x3x3x3x3$
$324 = 2^2 x\ 3^2 x\ 3^2$
$324 = (2 x 3 x 3)^2$
$\sqrt{324} = 2 x 3 x 3$
$\sqrt{324} = 18$

2) Find the square root of 1764 by prime factorisation.

2	1764
2	882
3	441
3	147
7	49
7	7
	1

$1764 = 2 x 2x3 x 3x7 x 7$
$1764 = 2^2 x\ 3^2 x\ 7^2$
$1764 = (2 x 3 x 7)^2$
$\sqrt{1764} = 2 x 3 x 7$
$\sqrt{1764} = 42$

3) Find the square root of 8100 by prime factorisation method.

2	8100
2	4050
3	2025
3	675
3	225
3	75
5	25
	5

$8100 = 2 x 2x3 x 3x3 x 3 x5 x 5$
$8100 = 2^2 x\ 3^2 x\ 3^2 x\ 5^2$
$8100 = (2 x 3 x 3 x5)^2$
$\sqrt{8100} = 2 x 3 x 3 x 5$
$\sqrt{8100} = 90$

Find the square roots of 729 and 7744 by prime factorisation method.

(i) 729	
(ii)7744	

Class:8th Activity Sheet-24

1) Find the smallest number which is to be multiplied to 252 to get a perfect square.

2	8100
2	4050
3	2025
3	675
3	225
3	75
5	25
	5

2) Find the smallest number which is to be multiplied by 768 to get perfect square.

3)Find the smallest number by which 2800 must be divided so that the quotient will be a perfect square.

Finding square roots by repeated subtraction.36

1) By repeated subtraction find the square root of 81.

(i) $81 - 1 = 80$ (ii) $80 - 3 = 77$ (iii) $77 - 5 = 72$

(iv) $72 - 7 = 65$ (v) $65 - 9 = 56$ (vi) $56 - 11 = 45$

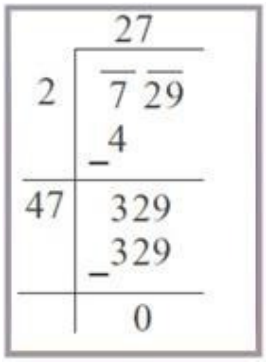
(vii) $45 - 13 = 32$ (viii) $32 - 15 = 17$ (ix) $17 - 17 = 0$

2) By repeated subtraction find the square root of 100 and 169.

Class:8th Activity sheet-25

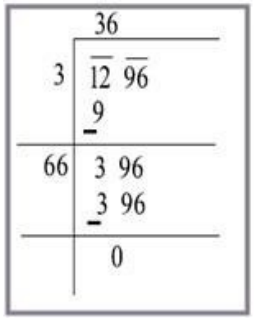
Finding square roots by division method:

1) Find the square root of 729 by division method.



$\therefore \sqrt{729} = 7$

2) Find the square root of 1296 by division method.



$\therefore \sqrt{1296} = 36$

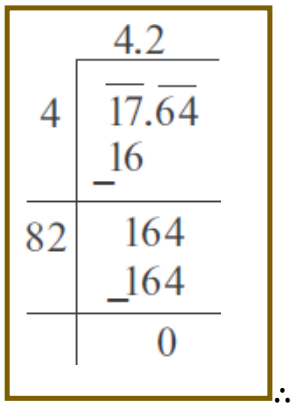
Find the square root of the following by division method.

(i) 529	(ii) 1024
(iii)3481	(iv)5776

Class:8th Activity Sheet-26

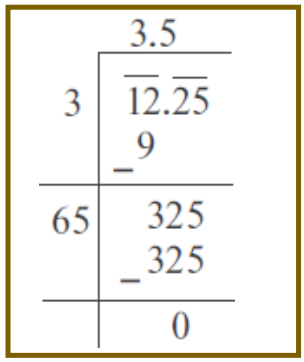
Square roots of decimal numbers.

1) Find the square root of 17.64 by division method.



$\therefore \sqrt{17.64} = 4.2$

2) Find the square root of 12.25 by division method.



$\therefore \sqrt{12.25} = 3.5$

Find the square root of the following decimal numbers by division method.

(1)7.29	(2)51.84
(3)31.36	(4) 42.25

Students Self-evaluation

Sl. No.	Learning outcomes	I Know	A little confusion	I don't Know
1	Examples for square numbers			
2	Properties of square numbers			
3	Sum of triangular numbers			
4	Numbers between two square numbers			
5	n^2 of n can be expressed as the sum of first odd numbers			
6	Pythagorean Triplet			
7	Examples for square root s			
8	Finding square roots by prime factorisation method			
9	Finding square roots by repeated multiplication.			
10	Finding square root by division method			
11	Finding square root of decimal number by division method.			

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