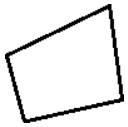
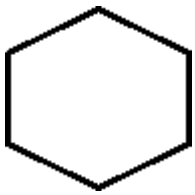
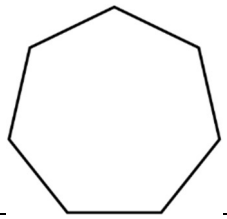
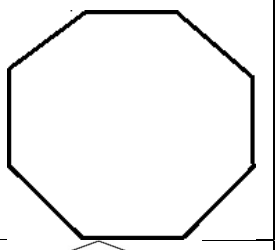
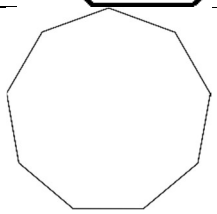
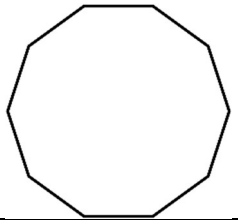
Education that enlightens!

Understanding Quadrilaterals

1. A plane figure formed by joining a number of points without lifting a pencil from the paper and without retracing any part of the figure is called a curve.
2. A curve which does not cut itself is called an open curve.
3. A curve which cuts itself is called a closed curve.
4. A simple closed curve is a closed curve which does not pass through one point more than once.
5. A simple closed curve made up of line segments is called a polygon.
6. The line segments that constitute a polygon are known as its sides and their end points are known as the vertices of the polygon.
7. Any two sides with a common end-point (vertex) are called the adjacent sides.
8. The end points of the same side of a polygon are known as the adjacent vertices.
9. The line segment obtained by joining vertices which are not adjacent are called the diagonals of the polygon.
10. Classification of polygons according to the number of sides:

Number of Sides or vertices	Classification	Figure
3	Triangle	
4	Quadrilateral	
5	Pentagon	
6	Hexagon	

7	Heptagon	
8	Octagon	
9	Nonagon	
10	Decagon	
n	n-gon	

11. A polygon having all sides equal and all angles equal is called a regular polygon. Polygons which are not regular are called irregular polygons.

12. A regular polygon is both equiangular and equilateral.

13. A polygon in which at least one angle is more than 180^{o} is called a concave polygon. A polygon in which each angle is less than 180^{o} is called a convex polygon.

14. A polygon having all sides equal and all angles equal is called a regular polygon. Polygons which are not regular are called irregular polygons.

15. For a regular polygon of n sides:

i. each exterior angle = $\left(\frac{360}{n}\right)^{o}$.

ii. each interior angle = 180^{o} – (each exterior angle).

16. For a convex polygon of n sides:
    i. Sum of all exterior angles = 4 right angles.
    ii. Sum of all interior angles = (2n – 4) right angles.

17. Number of diagonals in a polygon of n sides = $\frac{n\,n\,\_\,3}{2}$.

18. A quadrilateral is a four-sided polygon.

19. The sum of all the angles of a quadrilateral is 360^{o}.

20. If the line containing any side of the quadrilateral has the remaining vertices on the same side ofit, then the quadrilateral is called a convex quadrilateral.

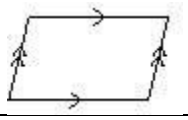
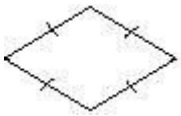
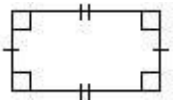
21. In a convex quadrilateral the measure of each angle is less than 180^{o}.

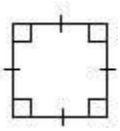
22. The sum of the interior angles of a pentagon is 540^{o}

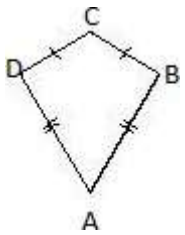
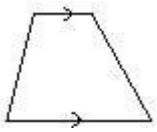
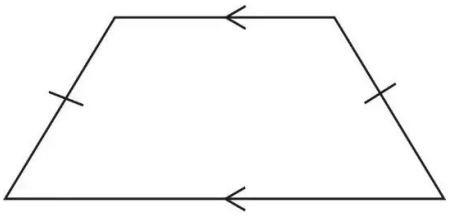
23. The sum of the measures of the external angles of any polygon is 360^{o}.

24. Each exterior angle of a regular polygon of n sides is equal to $\left(\frac{360^{o}}{n}\right)$.

25. Types of quadrilaterals and their properties:

Name of quadrilateral	Properties
Parallelogram: A quadrilateral with each pair of opposite sides parallel. 	1. Opposite sides are equal. 2. Opposite angles are equal. 3. Adjacent angles are supplementary. 4. Diagonals bisect one another.
Rhombus: A parallelogram with sides o equal length. 	1. All properties of a parallelogram. 2. Diagonals are perpendicular to each other.
Rectangle: A parallelogram with a right angle. 	1. All the properties of a parallelogram. 2. Each of the angles is a right angle. 3. Diagonals are equal.

Square: A rectangle with sides of equal length. 	All the properties of a parallelogram, a rhombus and a rectangle.

Kite: A quadrilateral with exactly two pairs of equal consecutive sides.  	1. The diagonals are perpendicular to one another. 2. One of the diagonals bisects the other. 3. If ABCD is a kite, then □ B = □ D but □ A □ □ C.
Trapezium: A quadrilateral with one pair of parallel side is called trapezium. 	1. One pair of parallel sides.
Isosceles Trapezium: A trapezium is said to be an isosceles trapezium, if its non-parallel sides are equal. 	1. One pair of parallel sides. 2. Non-parallel sides are equal.