Understanding Elementary Shapes

**Measuring Line Segments :**

* Comparison by observation:
* Comparison by Tracing
* Comparison using Ruler and a Divider

**Angle :** When a hand of a clock moves from one position to another position we have an example for an *angle*.

**Revolution :** One full turn of the hand is 1 *revolution*.

* **Complete angle**. The angle for one revolution is a **complete angle**.
* **Right Angle :** A *right angle* is ¼ revolution and measure of angle is 90°.
* **Straight Angle :** A *straight angle* is ½ a revolution and measure of angle is 180°.
* **Acute Angle :** An angle whose measure is less than that of a right angle.
* **Obtuse Angle :** If an angle is larger than a right angle, but less than a straight angle, it is

called an **obtuse angle**.

* **Reflex Angle :** A reflex angle is larger than a straight angle.

Measuring Angles by the Protractor

**Perpendicular Lines :** When two lines intersect and the angle between them is a right angle, then the lines are said to be **perpendicular**.

**Perpendicular bisector :** The *perpendicular bisector* of a line segment is a perpendicular to the line segment that divides it into two equal parts

**Classification of Triangles**

* **Scalene Triangle :** All the three sides are of unequal length
* **Isosceles Triangle :** Any two of the sides are of equal length
* **Equilateral Triangle :** All the three sides are of equal length
* **Acute angled triangle :** Each angle is acute
* **Right Angled triangle :** One angle is a right angle
* **Otuse Angled Triangle :** One angle is obtuse.

**Quadrilaterals :**

* **Rectangle :** Parallelogram with 4 right angles
* **Square :** A rhombus with 4 right angles
* **Parallelogram :** Two pairs of parallel sides
* **Rhombus :** Parallelogram with 4 sides of equal length
* **Trapezium :** One pair of parallel sides

**Polygons :** Polygon is a plane closed figure which made up of line segments.

A Polygon with 3 Sides : Triangle

A Polygon with 4 Sides : Quadrilateral

A Polygon with 5 Sides : Pentagon

A Polygon with 6 Sides : Heaxagon

A Polygon with 7 Sides : Heptagon

A Polygon with 8 Sides : Octagon

**Three Dimensional Shapes :**

* Prism**Faces :** The plane faces in a solid are known as Faces of a solid. 
* **Edges :** Two faces meet at a *line segment* called an **edge.**
* **Vertices :** Three edges meet at a point called a **vertex.**
* **Prism :** A prism has two identical bases; the other faces are rectangles.
* **Pyramid :** A pyramid is a shape with a single base; the other faces are triangles. 

Questions for practice

**Level 1**

1. Draw any line segment, say PQ. Take any point R lying in between P and Q. Measure the lengths of PQ, PR and RB. Is PQ = PR + RB ?

2. Where will the hand of a clock stop if it starts at 8 and makes ½ of a revolution, clockwise?

3. How many right angles do you make if you start facing south and turn clockwise to west?

4. Classify the following angles : a) 110° b) 78° c) 180° d) 210° e) 90° f) 25° g) 360°

5. Is it possible to construct a triangle with angles 80°, 70° , and 60° ? Give reasons.

6.How many degrees are there in the angle between the hands of a clock when it is 9 o’clock.

**Level 2**

1. If B is the mid point of AC and C is the mid-point of BD, where A,B,C,D lie on a straight line, say why AB = CD?

2. Which direction will you face if you start facing east and make ¼ of a revolution clockwise?

3. A traffic policeman is standing looking south. In which direction will he look if he turns to the left through three right angles.

4. Two angles of an obtuse angled triangle are 105° and 30°. Find the third angle.

5. What is the shape of the following objects :

i) Your instrument box ii) a football iii) A playing die iv) a metal pipe v) a birthday cap.

**Level 3**

1. Verify, whether D is the mid point of AG. 

2. Find the number of right angles turned through by the hour hand of a clock when it goes from 2 to 11.

3. Let PQ be the perpendicular to the line segment XY. Let PQ and XY intersect in the point A. What is the measure of ∠PAY?

4. Ramesh is driving his car towards south-west . In which direction will he drive his car if he turns through

i) a straight angle ii) a complete angle.

5. Draw a regular hexagon and draw as many diagonals as possible. Count the number of trianglas obtained.

6. Complete the table given below

|  |  |  |  |
| --- | --- | --- | --- |
| **3 Dimensional shape** | **Faces** | **Edges** | **Vertices** |
| Cuboid |  |  |  |
| Cube |  |  |  |
| Cylinder |  |  |  |
| Square pyramid |  |  |  |

**Worksheet**

1. P,Q, R are three points on a line such that PQ = 6 cm, QR = 4 cm and PR = 9 cm. Which of three points lies between the other two?

2. What angle is formed between North-East and South-West directions?

3. What is the measure of two and half right angles?

4. ABCD is a parallelogram as shown below

**A**

**C**

**B**

**D**

i) Name the pair of equal sides.

ii) Name the pair of equal angles.

iii) Nmae the diagonals.

5. What is the shape of a new chalk stick?

6.Square is a special kind of rhombus.

Do you agree? Give reason.

7. From the given figure.

Find ∠A+∠B+∠C+∠D+∠E+∠F

**A**

**B**

**C**

**D**

**E**

**F**