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TRIANGLES

INTRODUCTION

SUBJECT : MATHEMATICS
CHAPTER NUMBER: 06
CHAPTER NAME : TRIANGLES

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LEARNING OUTCOME

1.Students will be able to define similar figures.
2.Students will be able to define similar polygons.
3.Students will be able to know similar figures.
4.Students will be able to identify similar figures.

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Introduction to TRIANGLES ;

https://youtu.be/edtFK_7uViQ (11.20)

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SIMILAR FIGURES

- Two figures having the same shape but not necessary the same size are called similar figures.
- All circles are always similar but they need not be congruent. They are congruent if their radii are equal.
- All squares are similar.
- All equilateral triangles are similar.
- Any two line segments are always similar but they need not be congruent. They are congruent if their lengths are equal.
- All congruent figures are similar, but all similar figures are not congruent.
- If two figures are similar, one can be obtained from the other by shrinking or by stretching,without changing its shape.

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They are the photographs of the same Shri Jagannath temple but are in different sizes. Three photographs are similar.

- These are the photographs of Swamiji at different ages. These photographs are of same size but certainly they are not same shape. So they are not similar.

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SIMILAR POLYGONS

Two polygons of the same number of sides are similar, if

(i) their corresponding angles are equal and (ii) their corresponding sides are in the same ratio (or proportion)..

https://youtu.be/esEj5CGs8r4 (9.06)

If two polygons $ABCDE$ and $PQRST$ are similar, then from the above definition it follows that:

Angle at A = Angle at P, Angle at B = Angle at Q, Angle at C = Angle at R,

Angle at D = Angle at S, Angle at E = Angle at T

and, $$\frac{AB}{PQ} = \frac{BC}{QR} = \frac{CD}{RS} = \frac{DE}{ST} = \frac{EA}{TP}$$

If two polygons $ABCDE$ and $PQRST$, are similar, we write $ABCDE \sim PQRST$. Here, the symbol '~' stands for 'is similar to'.

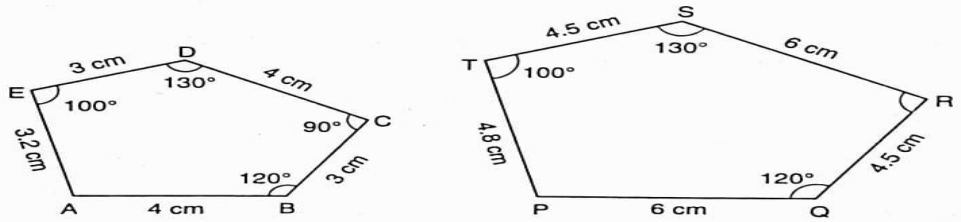

Fig. 4.4

NOTE 1 *It should be noted that for the similarity of polygons with more than three sides, the two conditions given in the definition are independent of each other i. e., either of the two conditions without the other is not sufficient for polygons with more than three sides to be similar. In other words, if the corresponding angles of two polygons are equal but lengths of their corresponding sides are not proportional, the polygons need not be similar. Similarly, if the corresponding angles of two polygons are not equal but length of the the corresponding sides are proportional, then the polygons need not be similar.*

NOTE 2 *Triangles are special type of polygons, In case of triangles, if either of the two conditions given in the above definition holds, then the other holds automatically.*

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1. Fill in the blanks using the correct word given in brackets :
(i) All circles are ……. (congruent, similar)

(ii) All squares are …… (similar, congruent)

(iii) All triangles are similar…….. (isosceles, equilateral)

(iv) Two polygons of the same number of sides are similar, if (a) their corresponding angles are…….. and (b) their corresponding sides are ……(equal, proportional)

2. Give two different examples of pair of
(i) similar figures.
(ii) non-similar figures.

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1. i)Similar
   ii)Similar
   iii)Equilateral
   iv)Equal ,proportional

2.i) a) pair of equilateral triangles
      b)Pair of squares
  ii) a)A square and a circle
      b) A rectangle and a triangle

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1. i)Similar
   ii)Similar
   iii)Equilateral
   iv)Equal ,proportional

2. Give two different examples of pair of

(*i*) similar figures. **(*ii*) non-similar figures.**

Sol. (*i*) Examples of similar figures :

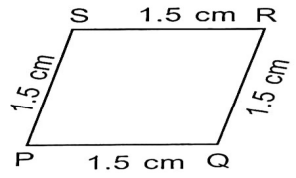
(*a*) Square (*b*) Regular hexagons

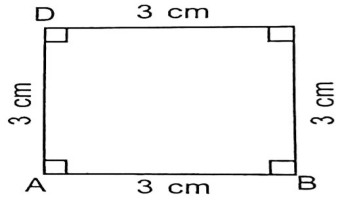
(*ii*) Examples of non-similar figures:

(*a*) Two triangles of different angles.

(*b*) Two quadrilaterals of different angles.

3. State whether the following quadrilaterals are similar or not.





Sol. No, the sides of quadrilateral PQRS and ABCD are proportional but their corresponding angles are not equal.

∴ These are not similar.

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Two triangles are similar, if

(i) their corresponding angles are equal

and

(ii) their corresponding sides are in the same ratio (or proportion).

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HOME ASSIGNMENT Ex. 6.1 Q. No 1 to Q3

AHA

- Give two different examples of pair of (i) similar figures. (ii) non-similar figures.

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THANKING YOU

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