

AL MOATTASSEM INTERNATIONAL SCHOOL - JUBAIL

Level - 8 Mathematics

Revision worksheet -2

Ch -4 Geometry

Similarity

Q1) Solution:

Since A'C' is parallel to AC, angles BA'C' and BAC are congruent.
Also angles BC'A' and BCA are congruent.

Since the two triangles have two corresponding congruent angles,
they are similar.

Q2) Solution:

- coordinates of the vertices, we can find the length of the sides of the two triangles.

$$AB = \sqrt{(4^2 + 2^2)} = \sqrt{20} = 2\sqrt{5} = 4.47$$

$$BC = \sqrt{((-4)^2 + 2^2)} = \sqrt{20} = 2\sqrt{5} = 4.47$$

$$CA = \sqrt{(4^2)} = 4$$

$$PQ = \sqrt{(2^2 + 1^2)} = \sqrt{5} = 2.236$$

$$QR = \sqrt{((-2)^2 + 1^2)} = \sqrt{5} = 2.236$$

$$RP = \sqrt{(2^2)} = 2$$

- We now calculate the ratios of the lengths of the corresponding sides.

$$AB / PQ = 2, BC / QR = 2 \text{ and } CA / RP = 2$$

- We can now write.

$$AB / PQ = BC / QR = CA / RP = 2$$

Q3) Solution:

- Angles ABC and A'BC' are congruent.
- Since the lengths of the sides including the congruent angles are given, let us calculate the ratios of the lengths of the corresponding sides.

$$BA / BA' = 10 / 4 = 5 / 2$$

$$BC / BC' = 5 / 2$$

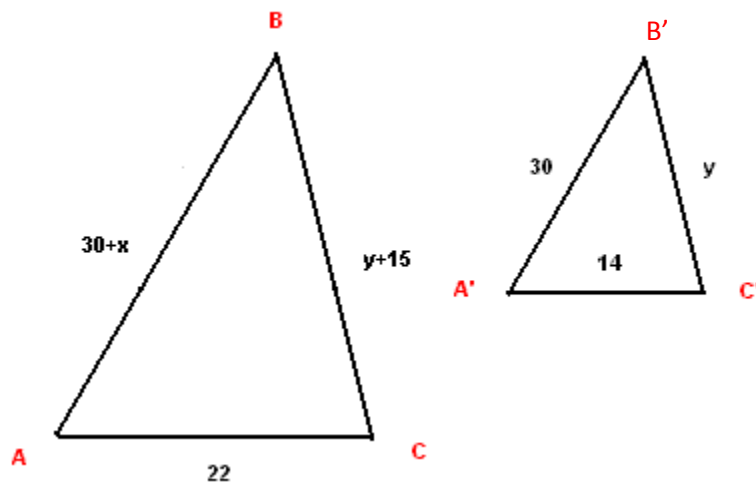
- The two triangles have two sides whose lengths are proportional and a congruent angle included between the two sides. The two triangles are similar.

Q4) Solution:

BA is a transversal that intersects the two parallel lines A'C' and AC, hence the corresponding angles BA'C' and BAC are congruent.

BC is also a transversal to the two parallel lines A'C' and AC and therefore angles BC'A' and BCA are congruent.

These two triangles have two congruent angles are therefore similar and the lengths of their sides are proportional. Let us separate the two triangles as shown below.



- We now use the proportionality of the lengths of the side to write equations that help in solving for x and y.
 $AB/A'B' = (30 + x) / 30$; $AC/A'C' = 22 / 14 = (y + 15) / y$
- An equation in x may be written as follows.
 $AB/A'B' = (30 + x) / 30 = 22 / 14 = 14 * (30 + x) = 30 * 22$
- Solve the above for x.
 $420 + 14x = 660$; $14x = 660 - 420$; $x = 240/14$; $x = 17.1$
 $x = 17.1$ (rounded to one decimal place).

- An equation in y may be written as follows.
 $AC/A'C' = 22 / 14 = (y + 15) / y$; $22(y) = 14(y + 15)$;
- $22y - 14y = 15$; $8y = 14 * 15$; $y = (14 * 15) / 8$
- Solve the above for y to obtain.
 $y = 26.25$

Q5) Solution:

If the two triangles are similar, their corresponding angles are congruent.

Hence angle BAH and B'A'H are congruent.

We now examine the triangles BAH and B'A'H'.

These triangles have two pairs of corresponding congruent angles:

BAH and B'A'H' and the right triangles BHA and B'H'A'.

The triangles are similar and therefore:

$$AB / A'B' = BH / B'H' = k$$