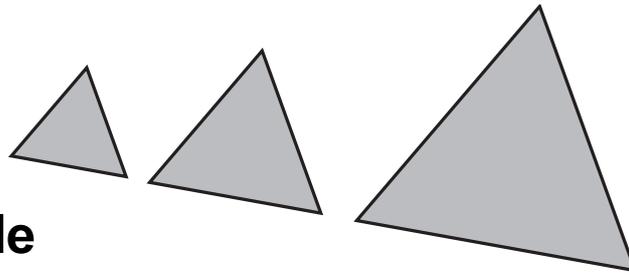


Activity 4



Area of triangle

Objective

To show that the area of a triangle is half the product of the base and the height using paper cutting and pasting.

Pre-requisite knowledge

1. Familiarity with activity 1A.
2. Formula for the area of a rectangle.
3. A diagonal of a parallelogram divides it into two congruent triangles.

Material Required

Chart paper, pencil, compass, scale, a pair of scissors, cello tape.

Procedure

For Right angle triangle

1. Cut a right angle triangle. [Fig 4 (a)]
2. Cut a triangle congruent to the right angle triangle.
3. Align the hypotenuse of the two triangles to obtain a rectangle. [Fig 4 (b)]

Observations

The students observe that two congruent triangles aligned on hypotenuse forms a rectangle.

They can see that area of rectangle = area of two congruent triangles.

Area of rectangle = base \times height.

Therefore, Area of triangle = $\frac{1}{2} \times$ Area of rectangle = $\frac{1}{2} \times$ base \times height.

Procedure

For Acute Angle Triangle

1. Cut an acute angle triangle and draw the perpendicular from the vertex to the opposite side. [Fig 4 (c)]
2. Cut a triangle congruent to it and cut this triangle along the perpendicular. [Fig 4 (d)]
3. Align the hypotenuse of these cut outs to the given triangle in order to obtain a rectangle. [Fig 4 (e)]

Observations

The students observe that two congruent triangles aligned in a specific way forms a rectangle.

They can see that area of rectangle = area of two congruent triangles.

Area of rectangle = base \times height.

Therefore, Area of triangle = $\frac{1}{2} \times$ Area of rectangle = $\frac{1}{2} \times$ base \times height.

Procedure

For Obtuse Angle Triangle

1. Cut an obtuse angle triangle. [Fig 4 (f)]
2. Cut a triangle congruent to this obtuse angle triangle.
3. Align the greatest side of the two triangles in order to obtain parallelogram. [Fig 4 (g)]

Observations

The students observe that aligning these two congruent triangles forms a parallelogram.

They can see that area of the parallelogram = area of two congruent triangles.

Area of parallelogram = base \times height.

Area of triangle = $\frac{1}{2} \times$ area of parallelogram = $\frac{1}{2} \times$ base \times height.

Learning Outcome

The students may infer that area of each triangle is half the product of its base and height irrespective of the sides and angles of triangle.

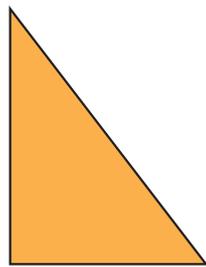


Fig 4 (a)

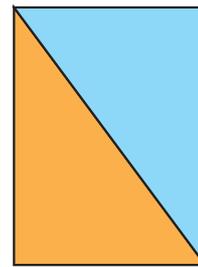


Fig 4 (b)

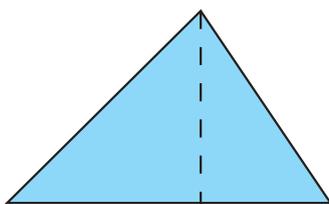


Fig 4 (c)

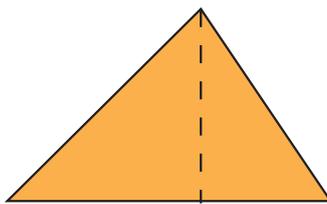


Fig 4 (d)

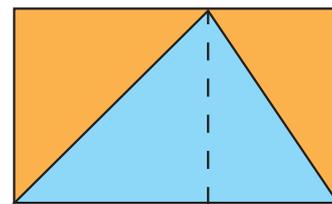


Fig 4 (e)

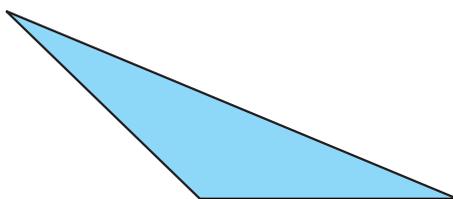


Fig 4 (f)

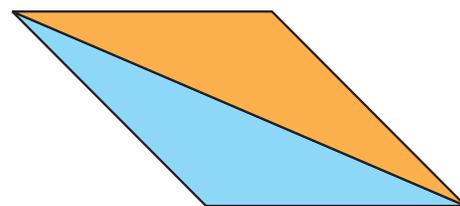


Fig 4 (g)