

## Answer on Question #60794 – Math – Analytic Geometry

### Question

Triangle ABC has vertices A(-1, 1, 3), B(-1, 3, 5), and C(-3, 3, 3). What kind of triangle is  $\Delta ABC$ ? Justify your answer.

### Solution

Compare the length of the sides of a triangle, which can be found by means of the formula of distance between two points  $(x_1, y_1, z_1), (x_2, y_2, z_2)$ :

$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2 + (z_2 - z_1)^2}$$

So

$$|AB| = \sqrt{(-1 - (-1))^2 + (3 - 1)^2 + (5 - 3)^2} = \sqrt{0 + 2^2 + 2^2} = \sqrt{8},$$

$$|AC| = \sqrt{(-1 - (-3))^2 + (1 - 3)^2 + (3 - 3)^2} = \sqrt{2^2 + 2^2 + 0} = \sqrt{8},$$

$$|BC| = \sqrt{(-3 - (-1))^2 + (3 - 3)^2 + (3 - 5)^2} = \sqrt{2^2 + 0 + 2^2} = \sqrt{8}.$$

Because  $|AB|=|BC|=|AC|$ , the triangle  $\Delta ABC$  is equilateral.

**Answer:** the triangle  $\Delta ABC$  is equilateral.