Ch - 7 Coordinate geometry

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Class10th Maths- chapter 7

This is problem 3 of exercise 7.3

1. Find the area of a triangle formed by joining the mid points of the sides of the triangle whose vertices are (0,-1) , (2,1) and (0,3). Find the ratio of this area to the area of the given triangle.

   Solution:
   Let the points be A(0,-1) , B(2,1) , C (0,3)
   Hence the points are :
   D = (1,0)
   E = (1,2)
   F = (0,1)
   Area of triangle =

   $$[\frac{1}{2}][|x_1(y_2 - y_3) + x_2(y_3 - y_1) + x_3(y_1 - y_2)|] \tag{1}$$

   From this formula, area of triangle ABC=

   $$[\frac{1}{2}][|0(1 - 3) + 2(3 + 1) + 0(-1 - 1)|] = 4 sq.unit \tag{2}$$

   Likewise, the area of the triangle DEF=

   $$[\frac{1}{2}][|1(2 - 1) + 1(1 - 0) + 0(0 - 2)|] = 1 sq.unit \tag{3}$$

   Therefore, the ratio between the triangle DEF and ABC = 1:4