Coordinate Geometry

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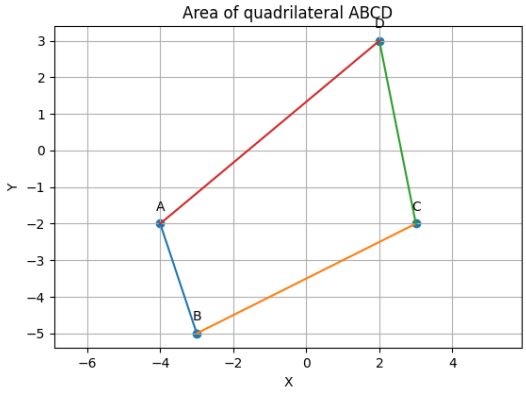
1 Class 10^{th} Maths - Chapter 7

This is Problem-4 from Exercise 7.3

QUESTION: Find the area of the quadrilateral whose taken in order are A(-4,-2), B(-3,-5), C(3,-2) and D(2,3).
solution

Construction



(1.0.1)

$We have two triangles ABC and ADC. Then,$ (1.0.2)

$First consider triangle ABC$ (1.0.3)

$$Area of triangle ABC = \frac{1}{2}\left|(AB \times BC)\right| \quad (1.0.4)$$

$$= \frac{1}{2}\begin{vmatrix} -1 & -6 \\ 3 & -3 \end{vmatrix} \quad (1.0.5)$$

$$= \frac{1}{2}\left((3) + (18)\right) \quad (1.0.6)$$

$$= \frac{1}{2}(21) \quad (1.0.7)$$

$$= 21/2 sq units \quad (1.0.8)$$

(1.0.9)

$$Now, area of triangle ADC \quad (1.0.10)$$

$$Area of triangle ACD = \frac{1}{2}\left|(AD \times DC)\right| \quad (1.0.11)$$

$$= \frac{1}{2}\begin{vmatrix} -6 & -1 \\ 5 & -5 \end{vmatrix} \quad (1.0.12)$$

$$= \frac{1}{2}\left((30) + (5)\right) \quad (1.0.13)$$

$$= \frac{1}{2}(35) \quad (1.0.14)$$

$$= 35/2 square units \quad (1.0.15)$$

(1.0.16)

$$NOW, AREA of quadrilateral = area of ABC + area of ADC \quad (1.0.17)$$

$$AREA = 21/2 + 35/2 \quad (1.0.18)$$

(1.0.19)

$$AREA = 28 sq.units \quad (1.0.20)$$