Name: Varsha Reddy **Assignment-4** **Roll No.** : FWC22038

PROBLEM:

ABCD,DCFE and ABFE are parallelograms.Show that ar(ADE) = ar(BCF)

Theory: Parallelograms on the same base and in between the same parallels are equal in area.
Given: ABCD,DCFE and ABFE are parallelograms.

Solution Statement:

We can see that the sides of a triangle ADE and BCF are also the opposite sides of a given parallelogram. Now we can show both the triangles are congruent using congruency property. We know that congruent triangles are equal areas.

SOLUTION:

parallelogram ABCD lies between same parallel lines AD and BC

$$\therefore AD = BC.....(1)$$

parallelogram DECF lies between same parallel lines DE and CF

$$\therefore DE = CF.....(2)$$

parallelogram ABEF lies between same parallel lines AE and FB

$$\therefore EA = FB.....(3)$$

In ΔADE , ΔBCF
$\therefore AD = BC$
$\therefore DE = CF$
$\therefore EA = FB$
$\therefore \Delta ADE = \Delta BCF$
Hence, Proved

Termux commands :
The input parameters for this construction are

Symbol	Value	Description
a	4.5	EA
b	4.5	BC
c	10	CD
d	2.5	DE
θ_1	$25\pi/180$	$\angle$BC
θ_2	$120\pi/180$	$\angle$DE
θ_3	$2\pi/3$	$\angle$AE
θ_4	$35\pi/180$	$\angle$CD
E	$\begin{pmatrix}0\\0\end{pmatrix}$	Point E

To Prove:

$$\mathbf{Ar(ADE) = Ar(BCF)} \tag{1}$$

$$\mathbf{v1 = A - D} \tag{2}$$

$$\mathbf{v2 = D - E} \tag{3}$$

Area of the triangle ΔADE is given by

$$\text{Ar}(\Delta\text{ADE}) = 1/2 \text{ x } \|\mathbf{V1} \times \mathbf{V2}\|$$

$$\mathbf{v3 = B - C} \tag{4}$$

$$\mathbf{v4 = C - F} \tag{5}$$

Area of the triangle ΔBCF is given by

$$\text{Ar}(\Delta\text{BCF}) = 1/2 \text{ x } \|\mathbf{V3} \times \mathbf{V4}\|$$

$$\mathbf{Ar(ADE) = Ar(BCF)} \tag{6}$$

0.1 Construction

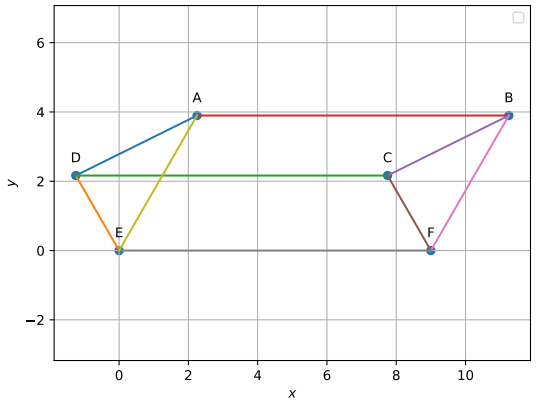

Figure of Construction

The below python code realizes the above construction:
`https://github.com/9705701645/FWC/blob/main/lines4.py`