

**Zadatak 4.** Točkama  $B$ ,  $C$ ,  $D$  i  $E$  dužina  $\overline{AF}$  podijeljena je na pet sukladnih dijelova. Ako je  $C(-1, 1)$ ,  $D(1, -2)$ , odredi koordinate točaka  $A$  i  $F$ .

*Rješenje.*

$$|\overrightarrow{AC}| : |\overrightarrow{CF}| = 2 : 3$$

$$|\overrightarrow{AD}| : |\overrightarrow{DF}| = 3 : 2$$

$$3|\overrightarrow{AC}| = 2|\overrightarrow{CF}| \implies |\overrightarrow{AC}| = \frac{2}{3}|\overrightarrow{CF}| \implies \lambda_1 = \frac{2}{3}$$

$$2|\overrightarrow{AD}| = 3|\overrightarrow{DF}| \implies |\overrightarrow{AD}| = \frac{3}{2}|\overrightarrow{DF}| \implies \lambda_2 = \frac{3}{2}$$

$$x_C = \frac{x_A + \lambda_1 x_F}{1 + \lambda_1}$$

$$x_D = \frac{x_A + \lambda_2 x_F}{1 + \lambda_2}$$

$$-1 = \frac{x_A + \frac{2}{3}x_F}{1 + \frac{2}{3}} \cdot \frac{5}{3}$$

$$1 = \frac{x_A + \frac{3}{2}x_F}{1 + \frac{3}{2}} \cdot \frac{5}{2}$$

$$-\frac{5}{3} = x_A + \frac{2}{3}x_F \cdot 3$$

$$\frac{5}{2} = x_A + \frac{3}{2}x_F \cdot 2$$

$$-5 + 3x_A + 2x_F \cdot 2$$

$$5 = 2x_A + 3x_F \cdot (-3)$$

$$-10 = 6x_A + 4x_F$$

$$-15 = -6x_A - 9x_F$$

$$-25 = -5x_F \implies x_F = 5$$

$$-5 = 3 \cdot x_A + 2 \cdot 5$$

$$-3x_A = 10 + 5 \implies x_A = -5$$

$$A(-5, 7)$$

$$F(5, -8)$$

$$y_C = \frac{y_A + \lambda_1 y_F}{1 + \lambda_1}$$

$$y_D = \frac{y_A + \lambda_2 y_F}{1 + \lambda_2}$$

$$1 = \frac{y_A + \frac{2}{3}y_F}{1 + \frac{2}{3}} \cdot \frac{5}{3}$$

$$-2 = \frac{y_A + \frac{3}{2}y_F}{1 + \frac{3}{2}} \cdot \frac{5}{2}$$

$$\frac{5}{3} = y_A + \frac{2}{3}y_F \cdot 3$$

$$-5 = y_A + \frac{3}{2}y_F \cdot 2$$

$$5 = 3y_A + 2y_F \cdot 2$$

$$-10 = 2y_A + 3y_F \cdot (-3)$$

$$10 = 6y_A + 4y_F$$

$$30 = -6y_A - 9y_F$$

$$40 = -5y_F \implies y_F = -8$$

$$5 = 3y_A + 2 \cdot (-8)$$

$$-3y_A = -16 - 5 \implies y_A = 7$$