

**Zadatak 4.** Odredi duljine male i velike osi te udaljenost žarišta elipse ako je dana njezina jednadžba:

- 1)  $9x^2 + 25y^2 = 225$ ;                      2)  $9x^2 + 25y^2 = 144$ ;  
 3)  $5x^2 + 9y^2 = 45$ ;                        4)  $\frac{1}{4}x^2 + y^2 = 1$ ;  
 5)  $3x^2 + 4y^2 = 48$ ;                        6)  $4x^2 + 16y^2 = 1$ .

*Rješenje.*

$$\begin{aligned}
 1) \quad & 9x^2 + 25y^2 = 225 \quad / : 225 \\
 & \frac{x^2}{25} + \frac{y^2}{9} = 1 \\
 \implies & a^2 = 25 \implies a = 5 \implies 2a = 10 \\
 & b^2 = 9 \implies b = 3 \implies 2b = 6 \\
 & e^2 = \sqrt{a^2 - b^2} = 4 \implies 2e = 8
 \end{aligned}$$

$$\begin{aligned}
 2) \quad & 9x^2 + 25y^2 = 144 \quad / : 144 \\
 & \frac{x^2}{16} + \frac{y^2}{\frac{144}{25}} = 1 \\
 \implies & a^2 = 16 \implies a = 4 \implies 2a = 8 \\
 & b^2 = \frac{144}{25} \implies b = \frac{12}{5} \implies 2b = \frac{24}{5} \\
 & e^2 = \sqrt{a^2 - b^2} = \frac{16}{5} \implies 2e = \frac{32}{5}
 \end{aligned}$$

$$\begin{aligned}
 3) \quad & 5x^2 + 9y^2 = 45 \quad / : 45 \\
 & \frac{x^2}{9} + \frac{y^2}{5} = 1 \\
 \implies & a^2 = 9 \implies a = 3 \implies 2a = 6 \\
 & b^2 = 5 \implies b = \sqrt{5} \implies 2b = 2\sqrt{5} \\
 & e^2 = \sqrt{a^2 - b^2} = 2 \implies 2e = 4
 \end{aligned}$$

$$\begin{aligned}
 4) \quad & \frac{1}{4}x^2 + y^2 = 1 \\
 & \frac{x^2}{4} + \frac{y^2}{1} = 1 \\
 \implies & a^2 = 4 \implies a = 2 \implies 2a = 4 \\
 & b^2 = 1 \implies b = 1 \implies 2b = 2 \\
 & e^2 = \sqrt{a^2 - b^2} = \sqrt{3} \implies 2e = 2\sqrt{3}
 \end{aligned}$$

$$5) \quad 3x^2 + 4y^2 = 48 \quad / : 48$$

$$\frac{x^2}{16} + \frac{y^2}{12} = 1$$

$$\Rightarrow a^2 = 16 \Rightarrow a = 4 \Rightarrow 2a = 8$$

$$b^2 = 12 \Rightarrow b = 2\sqrt{3} \Rightarrow 2b = 4\sqrt{3}$$

$$e^2 = \sqrt{a^2 - b^2} = 2 \Rightarrow 2e = 4$$

$$6) \quad 4x^2 + 16y^2 = 1$$

$$\frac{x^2}{\frac{1}{4}} + \frac{y^2}{\frac{1}{16}} = 1$$

$$\Rightarrow a^2 = \frac{1}{4} \Rightarrow a = \frac{1}{2} \Rightarrow 2a = 1$$

$$b^2 = \frac{1}{16} \Rightarrow b = \frac{1}{4}\sqrt{3} \Rightarrow 2b = \frac{1}{2}$$

$$e^2 = \sqrt{a^2 - b^2} = \frac{\sqrt{3}}{4} \Rightarrow 2e = \frac{\sqrt{3}}{2}$$