Zadatak 22. Odredi realni broj a za koji su dani pravci međusobno okomiti:

1) $y = -\frac{1}{2}x + 5$, $y = ax - 1$;

2) $ax - 2y + 11 = 0$, $2x + 3y - 7 = 0$;

3) $ax + 3y - 4 = 0$, $2x - ay - 1 = 0$.

Rješenje.

1)

$$p \ \ldots \ y = -\frac{1}{2} + 5$$

$$q \ \ldots \ y = ax - 1$$

$$p \perp q \iff k_p = -\frac{1}{k_q}$$

$$-\frac{1}{2} = -\frac{1}{a} \implies \boxed{a = 2}$$

2)

$$p \ \ldots \ ax - 2y + 11 = 0 \implies y = \frac{a}{2}x + \frac{11}{2}$$

$$q \ \ldots \ 2x + 3y - 7 = 0 \implies y = -\frac{2}{3}x + \frac{7}{3}$$

$$p \perp q \iff k_p = -\frac{1}{k_q}$$

$$\frac{a}{2} = \frac{3}{2} \implies \boxed{a = 3}$$

3)

$$p \ \ldots \ ax + 3y - 4 = 0 \implies y = -\frac{a}{3}x + \frac{4}{3}$$

$$q \ \ldots \ 2x - ay - 1 = 0 \implies y = \frac{2}{a}x - \frac{1}{a}$$

$$p \perp q \iff k_p = -\frac{1}{k_q}$$

$$-\frac{a}{3} = -\frac{1}{\frac{2}{a}}$$

$$-\frac{a}{3} = -\frac{a}{2} \quad / \cdot (-6)$$

$$2a = 3a \implies \boxed{a = 0}$$