

39.2

$$|\lambda_1 S_1| = 4 \text{ cm}$$

$$|\lambda_1 S_2| = 3,5 \text{ cm}$$

$$|\lambda_2 S_2| = 1,75 \text{ cm}$$

$$\lambda = 0,5 \text{ cm}$$

$$|\lambda_2 S_2|^2 + |\lambda_1 \lambda_2|^2 = |\lambda_1 S_2|^2 \quad / - |\lambda_2 S_2|^2$$

$$|\lambda_1 \lambda_2|^2 = |\lambda_1 S_2|^2 - |\lambda_2 S_2|^2$$

$$|\lambda_1 \lambda_2| = \sqrt{|\lambda_1 S_2|^2 - |\lambda_2 S_2|^2}$$

$$|\lambda_1 \lambda_2| = \sqrt{(3,5 \text{ cm})^2 - (1,75 \text{ cm})^2} = \sqrt{12,25 \text{ cm}^2 - 3,0625 \text{ cm}^2} = \sqrt{9,1875 \text{ cm}^2} = 3,031 \dots \approx 3 \text{ cm}$$

$$|\lambda_2 S_1|^2 = |\lambda_1 S_1|^2 + |\lambda_1 \lambda_2|^2$$

$$|\lambda_2 S_1| = \sqrt{|\lambda_1 S_1|^2 + |\lambda_1 \lambda_2|^2}$$

$$|\lambda_2 S_1| = \sqrt{(4 \text{ cm})^2 + (3 \text{ cm})^2} = \sqrt{16 \text{ cm}^2 + 9 \text{ cm}^2} = \sqrt{25 \text{ cm}^2} = 5 \text{ cm}$$

$$|\lambda_2 S_1| - |\lambda_1 S_1| = n_1 \lambda, \quad |\lambda_1 S_2| - |\lambda_2 S_2| = n_2 \lambda$$

$$n_1 = \frac{|\lambda_2 S_1| - |\lambda_1 S_1|}{\lambda}, \quad n_2 = \frac{|\lambda_1 S_2| - |\lambda_2 S_2|}{\lambda}$$

$$n_1 = \frac{5 \text{ cm} - 4 \text{ cm}}{0,5 \text{ cm}} = \frac{1 \text{ cm}}{0,5 \text{ cm}} = 2$$

$$n_2 = \frac{3,5 \text{ cm} - 1,75 \text{ cm}}{0,5 \text{ cm}} = \frac{1,75}{0,5 \text{ cm}} = 3,5$$

$$|\lambda_1 S_1| - |\lambda_2 S_2| = (2n + 1) \frac{\lambda}{2} \quad / \cdot \frac{2}{\lambda}$$

$$\frac{2}{\lambda} (|\lambda_1 S_1| - |\lambda_2 S_2|) = 2n + 1 \quad / - 1$$

$$\frac{2}{\lambda} (|\lambda_1 S_1| - |\lambda_2 S_2|) - 1 = 2n \quad / : 2$$

$$\frac{1}{\lambda} (|\lambda_1 S_1| - |\lambda_2 S_2|) - \frac{1}{2} = n$$

$$n = \frac{1}{\lambda} (|\lambda_1 S_1| - |\lambda_2 S_2|) - \frac{1}{2}$$

$$n = \frac{1}{0,5 \text{ cm}} \cdot (3,5 \text{ cm} - 1,75 \text{ cm}) - \frac{1}{2} = \frac{1,75 \text{ cm}}{0,5 \text{ cm}} - \frac{1}{2} = 3,5 - 0,5 = 3$$

Wyznaczenie fali marny w punkcie  $S_2$