

36.8

Donne:

$$v = 2 \text{ m/s}$$

$$f = 12,5 \text{ Hz}$$

$$\Delta x = 2 \text{ cm} = 0,02 \text{ m}$$

Seeker:

$$\Delta \varphi = ?$$

Wort:

$$T = \frac{1}{f}, \lambda = vT$$

$$\varphi = 2\pi \left(\frac{t}{T} - \frac{x}{\lambda} \right)$$

Rechnung:

$$T = \frac{1}{f} = \frac{1}{12,5 \text{ Hz}} = 0,08 \text{ s}$$

$$\lambda = vT = 2 \frac{\text{m}}{\text{s}} \cdot 0,08 \text{ s} = 0,16 \text{ m}$$

$$\begin{aligned} \Delta \varphi &= |\varphi_1 - \varphi_2| = \left| 2\pi \left(\frac{t}{0,08} - \frac{x}{0,16} \right) - 2\pi \left(\frac{t}{0,08} - \frac{x+0,02}{0,16} \right) \right| = \\ &= \left| \cancel{\frac{2\pi t}{0,08}} - \cancel{\frac{2\pi x}{0,16}} - \cancel{\frac{2\pi t}{0,08}} + \cancel{\frac{2\pi x}{0,16}} + \frac{0,04\pi}{0,16} \right| = \left| \frac{0,04\pi}{0,16} \right| = \frac{\pi}{4} \end{aligned}$$

$$\text{Ans: } \Delta \varphi = \frac{\pi}{4}$$