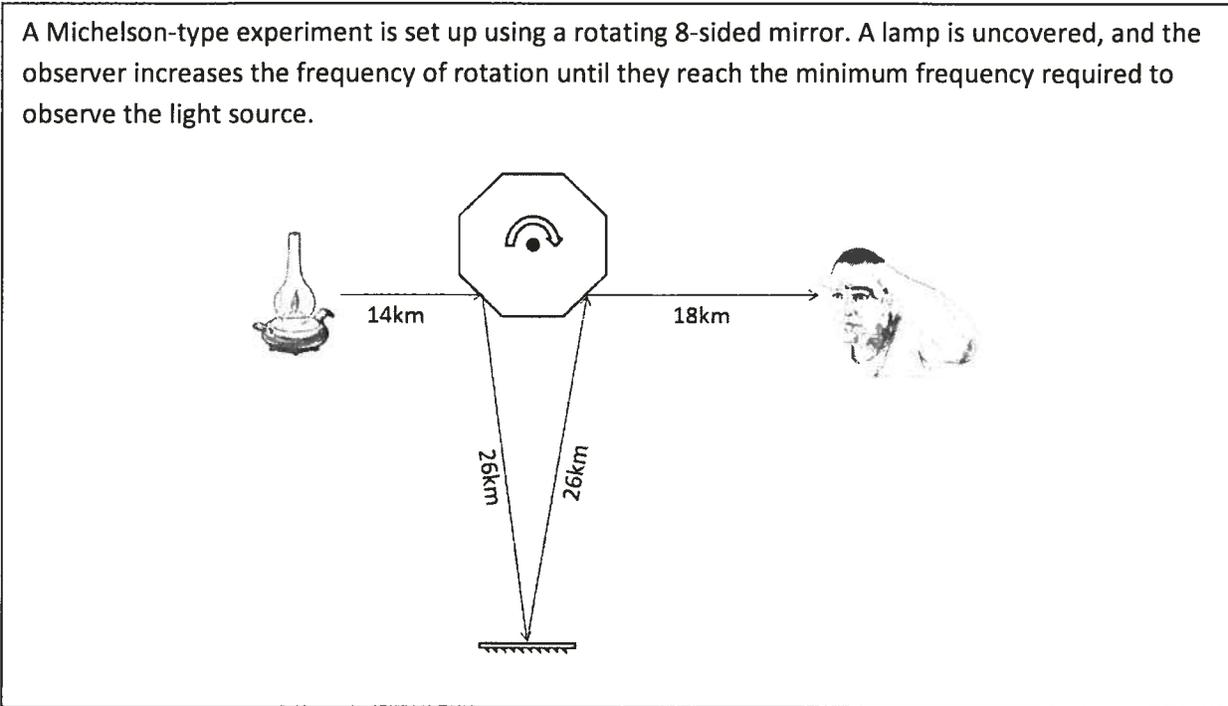


First Name: _____

Last Name: _____

L03 - Formative Quiz - Speed of Light

Use the following information to answer Q1 to Q4.



Q1: How much distance must the light travel in $1/8^{\text{th}}$ of a rotation?

- a) 26km
- b) 32km
- c) 52km $26 + 26$
- d) 84km

FLIP THE PAGE TO CONTINUE

KEY

Q2: When the rotating mirror is rotating at the minimum frequency required for the observer to see the light, the time it takes the mirror to rotate $1/8^{\text{th}}$ of a rotation is $a.bc \times 10^{-d}$ seconds, where $a, b, c,$ and d are ____, ____, ____, and _____. (1 mark)

(Record your four-digit answer in the numerical response boxes below.)

1	7	3	4
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$$v = \frac{d}{t}$$

$$(3.0 \times 10^8 \text{ m/s}) = \frac{(52 \times 10^3 \text{ m})}{t}$$

$$t = 1.7\bar{3} \times 10^{-4} \text{ s} \rightarrow \text{Use this unrounded value for next question.}$$

$$t = 1.73 \times 10^{-4} \text{ s}$$

Q3: When the rotating mirror is rotating at the minimum frequency required for the observer to see the light, the period of the mirror's rotation is $a.bc \times 10^{-d}$ seconds, where $a, b, c,$ and d are ____, ____, ____, and _____. (1 mark)

(Record your four-digit answer in the numerical response boxes below.)

1	3	9	3
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Period = full rotation ... so 8x bigger.

$$T = 8t$$

$$= 8(1.7\bar{3} \times 10^{-4} \text{ s})$$

$$T = 1.38\bar{6} \times 10^{-3} \text{ s} \rightarrow \text{Use this unrounded value for next question.}$$

$$T = 1.39 \times 10^{-3}$$

Q4: When the rotating mirror is rotating at the minimum frequency required for the observer to see the light, the frequency of the mirror's rotation is $a.bc \times 10^d$ seconds, where $a, b, c,$ and d are ____, ____, ____, and _____. (1 mark)

(Record your four-digit answer in the numerical response boxes below.)

7	2	1	2
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$$f = \frac{1}{T}$$

$$f = \frac{1}{1.38\bar{6} \times 10^{-3}}$$

$$f = 721.538 \text{ Hz}$$

$$f = 7.21 \times 10^2 \text{ Hz}$$

MARKING:

Beginning	0-1
Progressing	2
Competent	3
Exemplary	4