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(1)

$$\frac{1}{\lambda} = R \left( \frac{1}{2^2} - \frac{1}{n^2} \right)$$

$$\lambda = \frac{1}{R \cdot \left( \frac{1}{2^2} - \frac{1}{n^2} \right)} \quad (\text{両辺の逆数をとる})$$

$$\lambda = \frac{1}{R} \cdot \frac{2^2 n^2}{(n^2 - 2^2)} \quad (\text{右辺に } \frac{2^2 n^2}{2^2 n^2} \text{ をかける})$$

$$\lambda = \frac{4n^2}{R(n^2 - 2^2)} \quad (\text{式を整理}) \quad \cdots \textcircled{1}$$

(2)

①式に、 $R = 1.097 \times 10^7 \text{ } 1/m$  ,  $n = 3, 4, 5, 6$  を代入する。

$$\lambda_3 = \frac{4 \cdot 3^2}{(1.097 \times 10^7) \cdot (3^2 - 2^2)} = 6.563 \times 10^{-7} m$$

$$\lambda_4 = \frac{4 \cdot 4^2}{(1.097 \times 10^7) \cdot (4^2 - 2^2)} = 4.862 \times 10^{-7} m$$

$$\lambda_5 = \frac{4 \cdot 5^2}{(1.097 \times 10^7) \cdot (5^2 - 2^2)} = 4.341 \times 10^{-7} m$$

$$\lambda_6 = \frac{4 \cdot 6^2}{(1.097 \times 10^7) \cdot (6^2 - 2^2)} = 4.102 \times 10^{-7} m$$