UV-Vis Spectroscopy Question

The peptide AGLWIYFAY in solution, when read using spectrophotometry at 280nm, has an absorption of 0.18. Given that the pathlength used was 2cm, what is the concentration of the peptide in the solution?

Use the following as necessary:

Tryptophan $\varepsilon = 5690\ M^{-1}\ cm^{-1}$

Tyrosine $\varepsilon = 1280\ M^{-1}\ cm^{-1}$

Phenylalanine ε = negligible effect

ANSWER

Equation: Absorbance = (extinction coefficient)(pathlength)(concentration)

- Absorbance: ↑ given
- extinction coefficient: ↑ we can find this using the other given information
- pathlength: ↑ given
- concentration: ↑ our answer

① Find ε

A G L W I Y F A Y

W, Y, F, Y ↓ Aromatics

add up (5690 1280 negligible 1280

↳ $\varepsilon = 5690 + 1280 + 1280 = 8250$ ↳ extinction coefficient of whole peptide

② Plug in and solve

$0.18 = (8250)(2)(c)$

$1.09 \cdot 10^{-5}\ M$ = Concentration