When calculating the wavelength range of a wave using this formula: Speed of light= Wavelength x Frequency. I don't understand how to calculate this: (2.998 x 10^8)/(3 x10^14).

Solution:

$$v = \lambda * f$$

Checking of dimensionality

$$\left[\frac{m}{s}\right] = [m] \cdot [s^{-1}] = \left[\frac{m}{s}\right]$$

As I understand you want to calculate the wavelength. Then formula will be the following:

$$\lambda = \frac{v}{f}$$

where λ is the wavelength; f is the frequency; v is the speed of light.

Dimensionality of [λ] = [meter] or [m]; dimensionality of [f] = [second^{-1}] or [s^{-1}]; dimensionality of [v] = [meter/second] or [m/s].

Checking of dimensionality

$$[m] = \left[\frac{\frac{m}{s}}{s^{-1}}\right] = \left[\frac{m \cdot s}{s}\right] = [m]$$

Then

$$\lambda = \frac{2.998 \cdot 10^8}{3 \cdot 10^{14}} = 0.99 \cdot 10^{-6} \approx 1 \cdot 10^{-6}$$

If you have problem with modular exponentiation I can give you an additional explanations. When it is necessary to divide one degree to another with the same base exponent denominator is subtracted from the exponent of the numerator.

That's why $\frac{10^8}{10^{14}} = 10^{8-14} = 10^{-6}$