Name:_____

Period:_____ Date:_____

Exploring the Relationship Between Wavelength and Frequency

1. What is the apparent shape of the graph of wavelength vs. frequency?

   At first glance, it appears to be a linear relationship.

2. What is the linear regression equation obtained for wavelength vs. frequency?

   f(x) = 1011.79 x + 1.11779 E 6

3. What convinced you that this relationship is not linear?

   Once the regression line is placed, it is easier to see that the graphed data is curved and not linear in shape.

4. Is the relationship between wavelength and 1/frequency linear?

   yes

5. What is the linear regression equation obtained for wavelength vs. 1/frequency?

   f(x) = 3.33334 E -9 x -1.72988 E -12

6. Is the graph of 1/frequency vs. wavelength linear?

   yes

7. What is the linear regression equation obtained for 1/frequency vs. wavelength?

f(x) = 3 E 8 x + 0.00059

8. The y-intercept, b, in this relationship is approximately what integer value?

0

9. What is the value of the slope, m, in this relationship?

m = 3 x 10^{8}

10. m in this relationship is a very important and special value in science. Identify the significance of m for the linear regression equation obtained for 1/frequency vs. wavelength.

This number represents the speed of light in a vacuum.

11. Is the variation between wavelength and frequency direct or inverse?

inverse

12. What is the name of the shape of the graph obtained for the type of variation identified in question #11.

hyperbola

13. What equation is typically used in science to express the relationship between wavelength and frequency?

$c = \lambda v$ or $v = c/\lambda$ or $\lambda = c/v$