Honors Graphical Analysis

In the equation $I = \frac{V}{R}$, I is your dependent variable whereas V and R are the independent variables. Since I is the dependent variable, it will need to be graphed on the y-axis and since V is the independent variable, it will need to be graphed on the X-axis.

1. According to the STAAR chart I stands for _____, V stands for _____ and R stands for _____.

2. Suppose we had a resistance of 5 Ohms. That would make our equation above $I = \frac{V}{5}$. In the y = screen on the row for Y_1, enter $X/5$. Go to the Table (2^{nd} Graph) and look at the X and Y values. Complete the chart below.

X	Y
1	
2	
3	
4	
5	
6	

3. This table of data shows that in this equation X and Y are (directly / inversely) related and therefore V and I must be (directly / inversely) related.

4. From the information in the table, when the X value doubled, the Y value (doubled / halved).

5. From the information in the table, when the X value triples, the Y value is (three / one – third) times as much as it was previously.

6. From the information in the table, when the X value halved, the Y value (doubled / halved).

7. Now go to the Window screen on the graphing calculator set $X_{min} = 0$, $X_{max} = 6$, $Y_{min} = 0$, and your Y_{max} value will be the largest Y value you recorded in your table.
8. Press the Graph Key. Sketch the graph below.

9. This graph shows that X and Y are (directly / inversely) related and therefore V and I must be (directly / inversely) related.

10. Now instead of a 5 Ohm resistor we have a resistance of 10 Ohms. That would make our equation above $I = \frac{V}{10}$. In the y = screen on the row for Y_1, enter $X/10$. Go to the Table (2^{nd} Graph) and look at the X and Y values. Complete the chart below.

X	Y
1	
2	
3	
4	
5	
6	

11. This table of data shows that in this equation X and Y are (directly / inversely) related and therefore V and I must be (directly / inversely) related.

12. From the information in the table, when the X value doubled, the Y value (doubled / halved).

13. From the information in the table, when the X value triples, the Y value is (three / one – third) times as much as it was previously.

14. From the information in the table, when the X value halved, the Y value (doubled / halved).

15. Now go to the Window screen on the graphing calculator set $X_{min} = 0$, $X_{max} = 6$, $Y_{min} = 0$, and your Y_{max} value will be the largest Y value you recorded in your table.
16. Press the Graph Key. Sketch the graph below.

17. This graph shows that X and Y are (directly / inversely) related and therefore V and I must be (directly / inversely) related.

18. From looking at the two cases you have done did the value of the resistance have an affect on the type of relationship between V and I? (Yes / No)

19. Suppose we had a 9 Volt battery and you wanted to see how the amount of resistance affected the amount of current. That would make our equation above $I = \frac{9}{R}$. In the y = screen on the row for

Y_1, enter $9/X$. Go to the Table (2^{nd} Graph) and look at the X and Y values. Complete the chart below.

X	Y
1	
2	
3	
4	
5	
6	

20. This table of data shows that in this equation X and Y are (directly / inversely) related and therefore V and I must be (directly / inversely) related.

21. From the information in the table, when the X value doubled, the Y value (doubled / halved).

22. From the information in the table, when the X value triples, the Y value is (three / one – third) times as much as it was previously.

23. From the information in the table, when the X value halved, the Y value (doubled / halved).

24. Now go to the Window screen on the graphing calculator set $X_{min} = 0$, $X_{max} = 6$, $Y_{min} = 0$, and your Y_{max} value will be the largest Y value you recorded in your table.

25. Press the Graph Key. Sketch the graph below.

26. This graph shows that X and Y are (directly / inversely related and therefore V and I must be (directly / inversely) related.

In the equation $a_c = \frac{v_t^2}{r}$, a_c is your dependent variable whereas v and r are the independent variables. Since a_c is the dependent variable, it will need to be graphed on the y-axis and since v_t is the independent variable, it will need to be graphed on the X-axis.

27. According to the STAAR chart a_c stands for _____, v_t stands for _____ and r stands for _____.

28. Suppose a toy was moving in a circle with a radius of 2 meters. That would make our equation above $a_c = \frac{v_t^2}{2}$. In the y = screen on the row for Y_1, enter $X^2/2$. Go to the Table (2nd Graph) and look at the X and Y values. Complete the chart below.

X	Y
1	
2	
3	
4	
5	
6	

29. This table of data shows that in this equation X and Y are (directly / inversely) related and therefore a_c and v_t must be (directly / inversely) related.

30. From the information in the table, when the X value doubled, the Y value (doubled / quadrupled / halved / quartered).

31. From the information in the table, when the X value triples, the Y value is (three / nine / one – third / one - ninth) times as much as it was previously.

32. From the information in the table, when the X value halved, the Y value (doubled / quadrupled / halved / quartered).

33. Now go to the Window screen on the graphing calculator set $X_{min} = 0$, $X_{max} = 6$, $Y_{min} = 0$, and your Y_{max} value will be the largest Y value you recorded in your table.

34. Press the Graph Key. Sketch the graph below.

35. This graph shows that X and Y are (directly / inversely related and therefore V and I must be (directly / inversely) related.

To determine the relationship between variables, you should write the equation so that the dependent variable is to the left of the equal sign and the independent variables are to the right of the equal sign.

36. When the equation is in this format, if the independent variable is in the numerator of the equation, it will ALWAYS be (directly / inversely) related to the dependent variable.

37. When the equation is in this format, if the independent variable is in the denominator of the equation, it will ALWAYS be (directly / inversely) related to the dependent variable.

38. In the equation $F_g = G\left(\frac{m_1 m_2}{d^2}\right)$, F_g stands for _____, G stands for _____, m_1 stands for _____, m_2 stands for _____ and d stands for _____.

39. According to the equation above, m_1 and F_g are (directly / inversely) related and therefore if m_1 doubles then F_g must (double / quadruple / half / quarter) if all the other variables remain constant.

40. According to the equation above, m_2 and F_g are (directly / inversely) related and therefore if m_2 halves then F_g must (double / quadruple / half / quarter) if all the other variables remain constant.

41. According to the equation above, d and F_g are (directly / inversely) related and therefore if d halves then F_g must (double / quadruple / half / quarter) if all the other variables remain constant.

42. According to the equation above, if d doubles and m_1 halves then F_g must (four / eight / sixteen / one-forth / one-eighth / one-sixteenth) as much if all the other variables remain constant.