**Multi-Step Equation Challenge**

Let’s look at some challenging equations. We will do the first one together.

1. Solve 7(2*a* + 3) – 15 = 3(4*a* + 7) – 3

Distribute:

Combine like terms:

Get all variable terms on one side:

Get all constant terms on opposite side:

Solve for *a*:

Solve the following equations.

1. 2(2*b* + 1) + 5 = 3(2*b* + 1) – *b* 3. 9(*c* + 2) – 11 = 5(2*c* + 3) – 2*c*

4. 5(3*d* + 2) + 15 = 4(2*d* + 5) + 7*d* + 5 5. 4(2*e* + 6) – 14 = 2(5*e* + 5) – 2*e*

6. 8(3*f* + 4) – 9*f* = 7(3*f* + 2) + 10 7. 5(3*g* + 2) – 15 = 5(3*g* + 5) + 3*g*

1. The graphing calculator may also be used to explore question 3 above. Put the expression on the left side into *Y*1, and put the expression on the right side into *Y*2. Graph the two equations together in the same window. Does the graph verify your answer? Explain.
2. The graphing calculator may also be used to explore question 4 above. Put the expression on the left side into *Y*1, and put the expression on the right side into *Y*2. Graph the two equations together in the same window. Does the graph verify your answer? Explain.
3. The graphing calculator may also be used to explore question 5 above. Put the expression on the left side into *Y*1, and put the expression on the right side into *Y*2. Graph the two equations together in the same window. Does the graph verify your answer? Explain.
4. The graphing calculator may also be used to explore question 6 above. Put the expression on the left side into *Y*1, and put the expression on the right side into *Y*2. Graph the two equations together in the same window. Does the graph verify your answer? Explain.