Topic 12: Reasoning with Equations (A.REI 10)

Purpose: The purpose of the first three examples is to get students to get students to connect equations, graphs and tables to the situations they represent. The final three examples ask students to solve more complex problems. Please use your professional judgment when following this guide, if students are struggling with the content and need more support, then provide that additional support.

Core Standards Focus:
A.REI 10- Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line).
A.REI 11- Explain why the x-coordinates of the points where the graphs of the equations $y = f(x)$ and $y = g(x)$ intersect are the solutions of the equation $f(x) = g(x)$; find the solutions approximately, e.g., using technology to graph the functions, make tables of values, or find successive approximations. Include cases where $f(x)$ and/or $g(x)$ are linear, polynomial, rational, absolute value, exponential, and logarithmic functions.*

Launch (Individual time): Starting with example 1, ask students to take 1 minute individually to consider the questions asked in the problem. If students cannot articulate how they know the points will form a straight line prompt them to consider the change in x and the change in y as represented in the table. Some students may not be able to start on this task. Identify those students and consider pairing them with another student who may be able to provide additional support. If most of the class is unable to start on the task then facilitate the first example as a whole class think-aloud. Make sure all students understand the first example before moving on to the next example. Otherwise, move on to the explore phase.

Explore (pairs): Using example 2, give students a few minutes to work together to use the graph to identify the height of the ball after 1 second. If students are unable to verify the value that they have identified then you may want to show them how to do this using example 1. Repeat this process with example 3 to provide students additional practice and to solidify their thoughts.

Discuss (Whole Class): Call on some students to share their choices and talk about their reasoning. Be selective with the student work you use and sequence the work in a way that will connect a variety of ideas. Use the FluidMath program to check their work. The second and third examples for this topic can be completed in an accelerated manner as long as the first example was completed thoroughly. After the first three examples have been completed, return to the launch, explore, discuss cycle with examples 4 through 6.