Topic 11: Graphing Functions (F.IF 7,9)

Purpose: The purpose of the first three examples is to get students to identify key features of a function written in different forms. They also need to create equations with specific characteristics. The final three examples ask students to solve problems involving functions expressed in different ways. 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:
F.IF 7- Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.
F.IF 9- Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). *For example, given a graph of one quadratic function and an algebraic expression for another, say which has the larger maximum.*

Launch (Individual time): Starting with example 1, drag the functions to the grid one at a time asking students to observe what happens. You may need to do this a few times before students can draw conclusions about what is happening. 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. Now, move the screen and ask students to identify the slope and intercepts for the repeated function. The last part of the example asks students to create equations that meet specific criteria. Each requirement should be taken separately so that each function is unique. 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, drag the functions to the grid and ask students to work together to explain what is happening. You may be able to move more rapidly through this second example. Go on to the second and third parts of this example as students demonstrate they are gaining understanding. 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, and discuss cycle with examples 4 through 6. These last three examples ask students to compare functions that are expressed in different forms. Students may need significant guidance and support on example 4 but may be able to work more independently on examples 5 and 6.