

Topic 7: Parallel and Perpendicular Lines: (G-GPE.5)

Purpose: The purpose of the first three examples is to get students to write equations of lines that are parallel and perpendicular to a given line. The final three examples ask students to write an equation of a line that is parallel and an equation of a line that is perpendicular to a given line. 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:

G-GPE.5 Prove the slope criteria for parallel and perpendicular lines and use them to solve geometric problems (e.g., find the equation of a line parallel or perpendicular to a given line that passes through a given point).

Launch (Individual time): Starting with example 1, ask students to take 1 minute individually to identify the line that they think is parallel to the given line. 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. Choose a student to share their response and justify their choice. Repeat this cycle for the perpendicular line. You may want to pick a student whose argument is based on the slope of the two lines. Make sure all students understand the first example before moving on to the next example.

Explore (pairs): Using example 2, give students a few minutes to work together to identify the parallel and perpendicular lines for the given graph. If students are stuck, consider suggesting that students identify the slope of the given line as a starting point. They may be able to find the parallel line easier because the slope is the same. Perpendicular lines may require more practice. 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. Remember that in examples 4 through 6 students need to write equations of parallel and perpendicular lines. You may need to review slope-intercept form and talk a little about the number of lines that can be written (i.e. infinite) before students are able to complete example 4.