

## *First to Finish*

### **Common Core Standard**

G.CO.12 Make formal geometric constructions with a variety of tools and methods (compass and straightedge, string, reflective devices, paper folding, dynamic geometric software, etc.). *Copying a segment; copying an angle.*

G.MG.A.3 Apply geometric methods to solve design problems.

*Common Core Traditional Pathway: Geometry, Unit 1*

### **The Task**

You and a partner have been selected to be on the reality TV show, *First to Finish*. The object of the game is to make it through an obstacle course first; however, there are constraints on the path you may take. The shows creators have determined specific angles at which you can turn and distances you are allowed to walk before you must turn. Each of the three options you have been provided can be used in some way to guarantee you a path to the finish. In addition, you may choose to combine multiple options to create your own path. What's the catch? You may not use any measurement tools to chart your path through the course.

The course map has been provided for you, as well as the angles and paths you are allowed to follow. You and your partner may use any geometric tools other than rulers and protractors to construct a path through the course map. There are many feasible paths to the finish. The team that creates the most efficient feasible path will move on to the next round. Good luck racers!

### **Facilitator Notes**

1. Groups should be given access to patty paper, compasses, straight edges without ruler markings, and any other non-traditional materials that may be helpful. Groups will also need copies of the Obstacle Map resource and the Path Options resource. Groups may need multiple copies of each in order to try different options.
2. Students should be encouraged to copy their segments in any direction. In addition, they should understand that, while they are copying the angle to get a specific turn, they are to adjust the legs of the angle based on the distances they are allowed.
3. If certain groups find a path through the course quickly, challenge them to find multiple paths in order to determine maximum efficiency.
4. As a class, be sure to discuss the efficiency of each group's path. Have groups explain their methods of construction and argue in favor of their own path through the course. Students may argue that the path with the shortest total distance, the fewest turns, or the

fewest obstacles is the most efficient. They may also argue that certain paths are easier to re-create, depending on their methods of construction. For instance, Option 1 allows for 90-degree angles, which some students may argue are easier. In addition, other paths could be possible within each option or as a combination of options. Groups must come to a consensus on which path they will take.

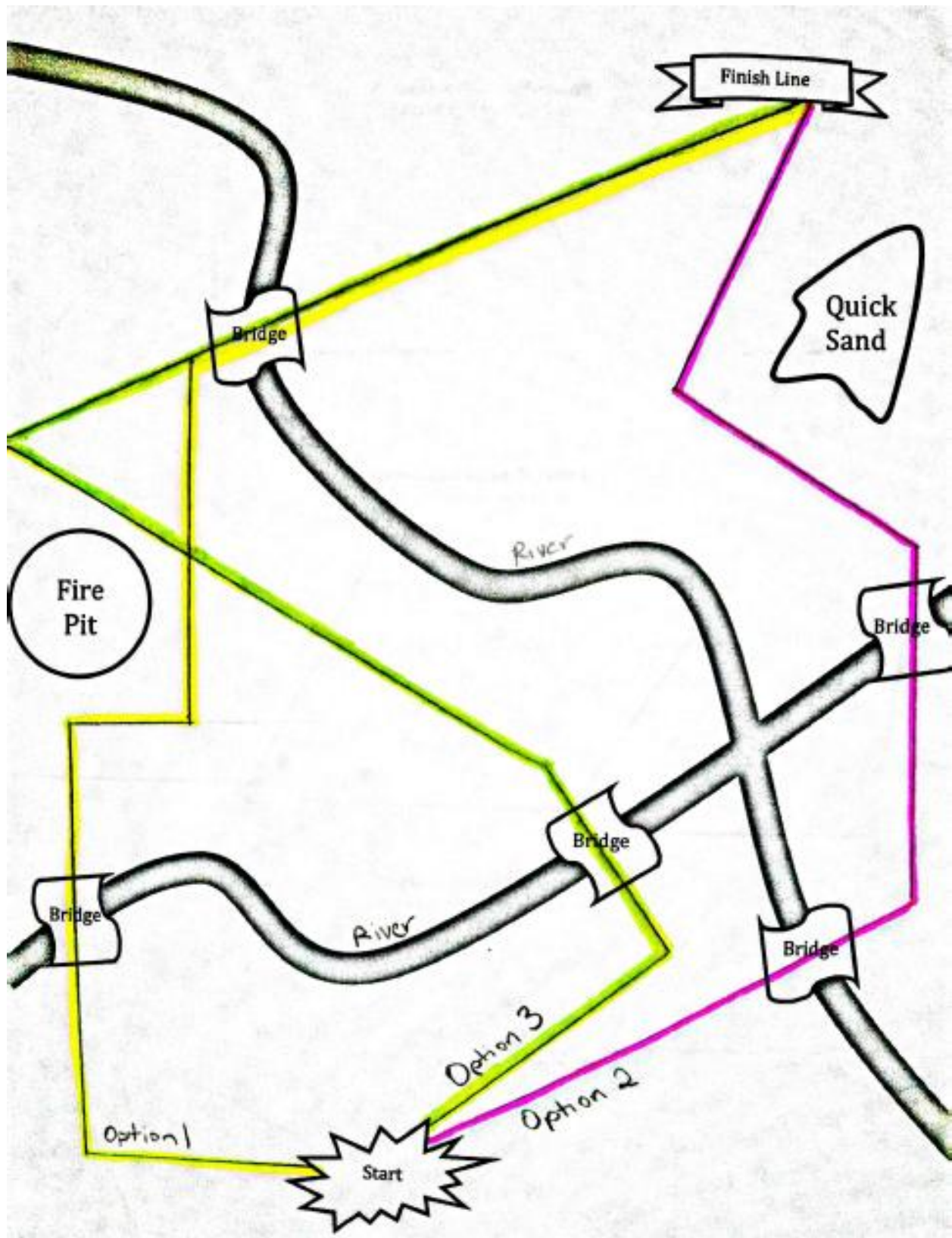
5. You may wish to give all groups all three options, or to limit options based on time allotted, level of rigor being sought, or student's comfort with construction tools.
6. As a possible enrichment, you can have students scale the map to the size of the classroom and approximate the obstacles. Using navigational compasses and measuring tools, have each group re-create their path to the finish line while being timed. You could also choose to do this in a gymnasium or elsewhere on the school's campus.

### **Follow-Up Questions**

1. How did your group decide on the best path to the finish? What were the processes involved in making the final decision? Did you come up with more than one path?
2. Explain the process and tools you used to copy a segment and an angle.
3. What was easy about the constructions? What was difficult? Which tools made the task easier?
4. Why should you win the prize? What makes your path the most efficient? Think about how it was constructed and what will be required of you once you get onto the course.

### **Solutions**

Sample solution for each option on the following page.



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