

Guide for Task 3

Guide for Task 3a

1. Using the sketch, move the five points to create a new track. The red point represents the start and finish line.
2. Check the box labeled “New Starting Point.” A new red point should appear. This represents the new start and finish line for the new Olympic track. Place this wherever you like. Check the box labeled “Translated graph” to see a congruent track in red. If you are exploring with the whole class, ask the students what the scale factor of this new track in red is.
3. Slide the “ScaleFactor” scale. You can choose any number between 0.2 and 2 in increments of 0.2. This is going to be your scale factor for the new track.
4. Check the box labeled “Translated then dilated graph” to see the new track in green.

Guide for Task 3b

1. Using the sketch, move the five points to create a track. The red point represents the start and finish line.
2. Check the box labeled “Tower.” A new green point should appear. This represents center of dilation. Place this wherever you like.
3. Slide the “ScaleFactor” scale. You can choose any number between 0.2 and 2 in increments of 0.2. This is going to be your scale factor for the new track.
4. Check the box labeled “New Starting Point with Tower.” A new red point should appear. This represents the new start and finish line for the new Olympic track.
5. Ask students to describe (a) the distance between the tower and the old start and finish line *and* (b) the distance between the tower and the new start and finish line. The distance between the tower and the old start and finish line is multiplied by the scale factor to obtain the distance between the tower and the new start and finish line.
6. Check the box labeled “Dilated graph” to see the new track in yellow.

Connecting Tasks 3a and 3b

1. First, create a “New Starting Point with Tower” using steps 1 through 4 in Task 3b.
2. Create a “New Starting Point” and drag it over the “New Starting Point with Tower” (i.e., you will have two red points overlapping each other).
3. Check the “Translated then dilated graph” box to see the track in green. Uncheck this to hide the track.
4. Check the box labeled “Dilated graph” to see the track in yellow. This track should be congruent to the green track.

Task 3a: Creating a New Track in a Different Location

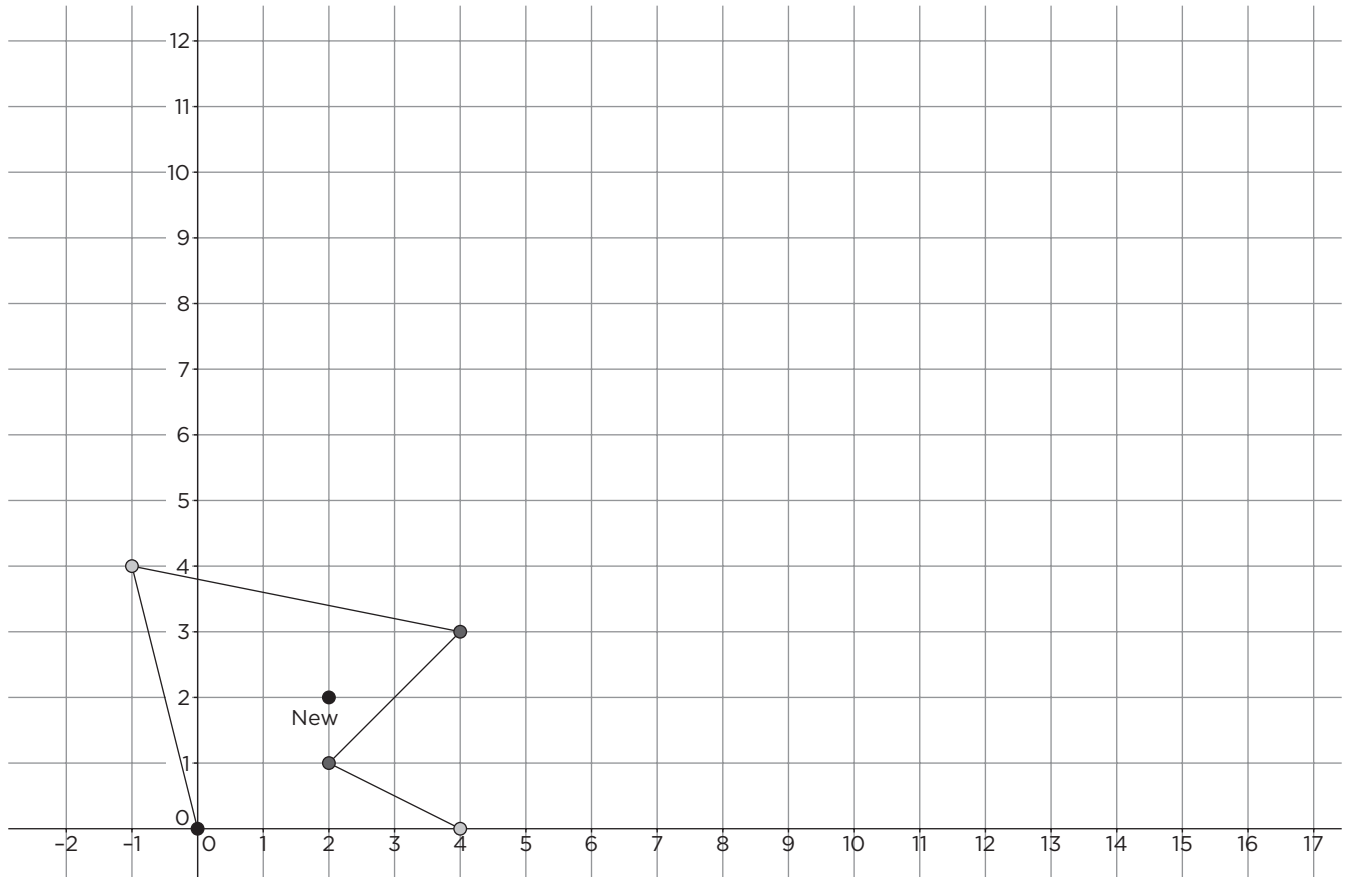
- A. The track on the sheet was constructed for the Women's Biathlon event at the Winter Paralympic Games. The Olympic committee wants to create a similar track but wants the track to be scaled by a factor of 1.5. On the map, the red dot represents the new start/finish line. Draw the track for the Olympic event. Write down your thinking for creating the new track below.
- B. The Olympic committee wants to create a tourist track that is similar to the track for the Olympics and Paralympics. However, they want the distance to be half of the Paralympic track. They want to construct the start/finish line for this track at $(8, 0)$. Draw the tourist track.

Task 3b: Creating a New Track With a Medical Tower

- A. The track below was constructed for the Women's Biathlon event at the Winter Paralympic Games. The Olympic committee wants to create a similar track, but now they want to build it based on a medical tower that oversees the tracks for any emergencies.
1. They want the new start/finish lines placed in the same direction as the old start/finish line but 1.5 times farther out. Plot the new start/finish line on the graph.
 2. They also want each corner of the track to be 1.5 times farther out than the corners of the original track. Plot the corners of the new track.
- B. The committee wants to also create a practice track, but the track will be closer to the medical tower by a factor of 0.5. Draw the practice track using the ideas from when you created the Olympic track.

What do you notice about the tracks you created for Tasks 3a and 3b? Explain your findings.

Task 3a: Creating a New Track in a Different Location



Task 3b: Creating a New Track With a Medical Tower

