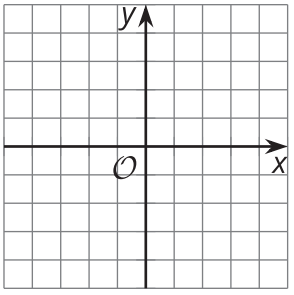
Unit 6 Lesson 10: Parallel Lines in the Plane

1 Translating Lines (Warm up)

Student Task Statement

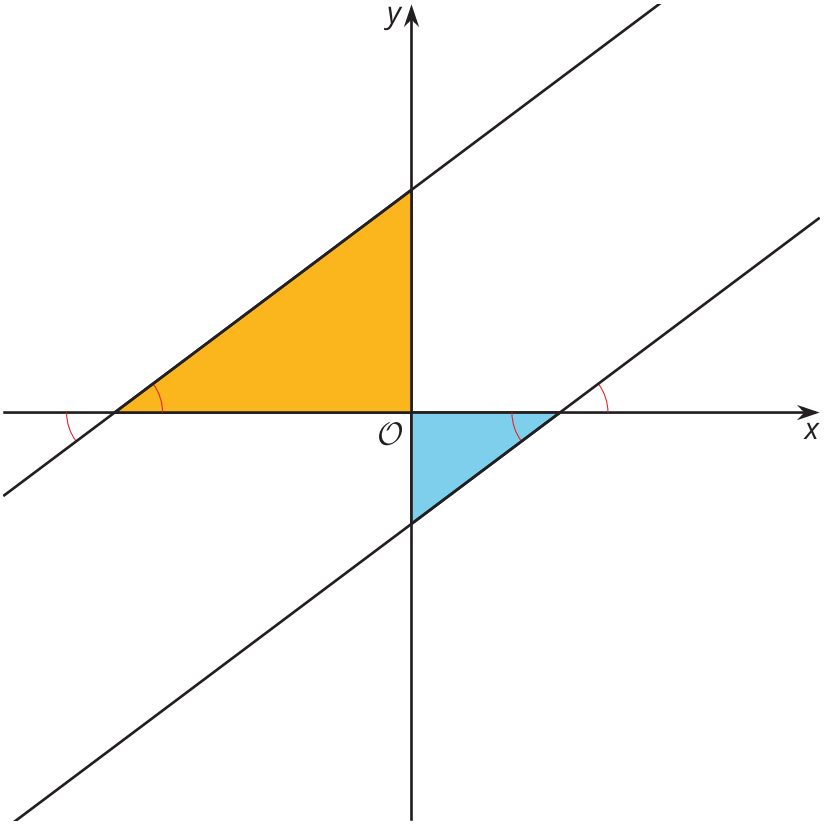
1. Draw any non-vertical line in the plane. Draw 2 possible translations of the line.



2. Find the slope of your original line and the slopes of the images.

2 Priya's Proof

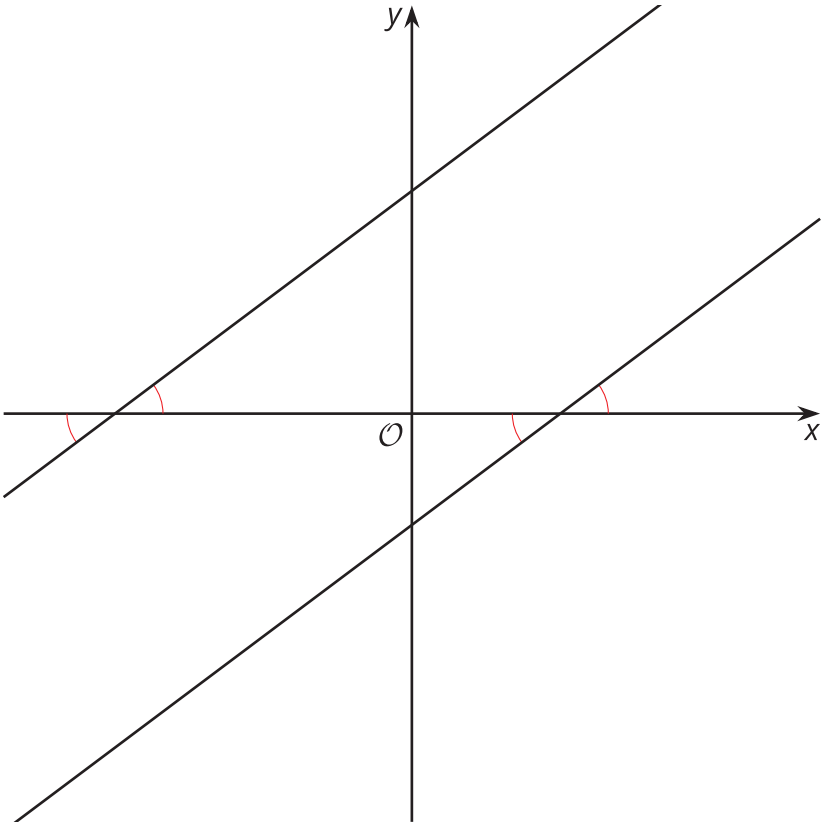
Images for Launch



Student Task Statement

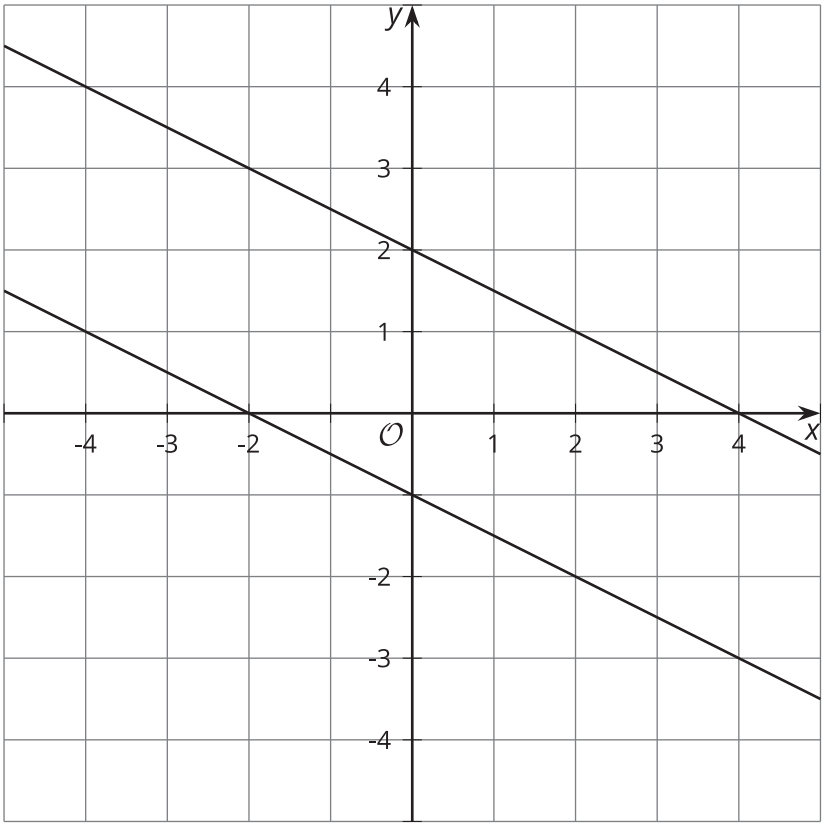
Priya writes a proof saying:

Consider any 2 parallel lines. Assume they are not horizontal or vertical. Therefore they must pass through the x-axis as well as the y-axis. This forms 2 right triangles with a second congruent angle. Call the angle θ. The tangent of θ is equal for both triangles. Therefore the lines have the same slope.



1. How does Priya know the right triangles have a second congruent angle?
2. Show or explain what it means that the tangent of θ is equal for both triangles.
3. How does this prove the slopes of parallel lines are equal?

Activity Synthesis



3 Prove Your Parallelogram

Student Task Statement

1. Write the equation of a line parallel to $y = 2x + 3$, passing through $(-4, 1)$.
2. Graph both lines described in the previous question.
3. Draw a parallelogram using the 2 lines you graphed and using $(-4, 1)$ as one of the vertices.
4. Prove that your figure is a parallelogram.

Images for Activity Synthesis