



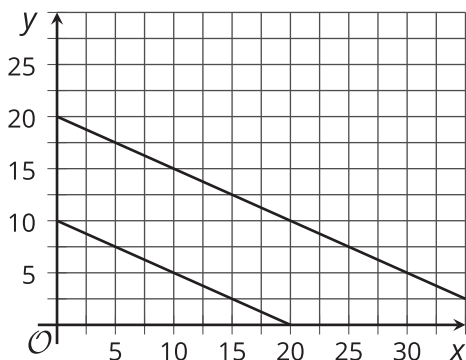
Equations of All Kinds of Lines

Let's write equations for vertical and horizontal lines.

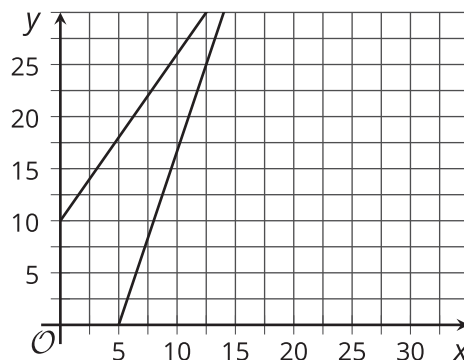
12.1 Which Three Go Together: Pairs of Lines

Which three go together? Why do they go together?

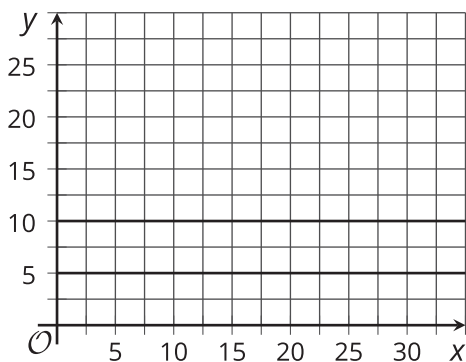
A



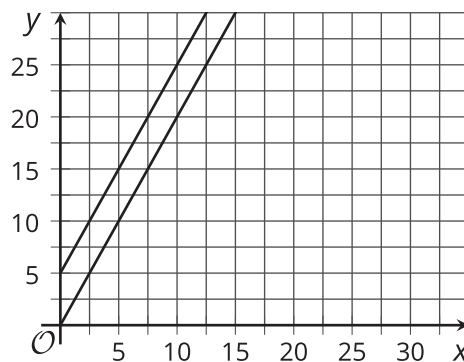
B



C

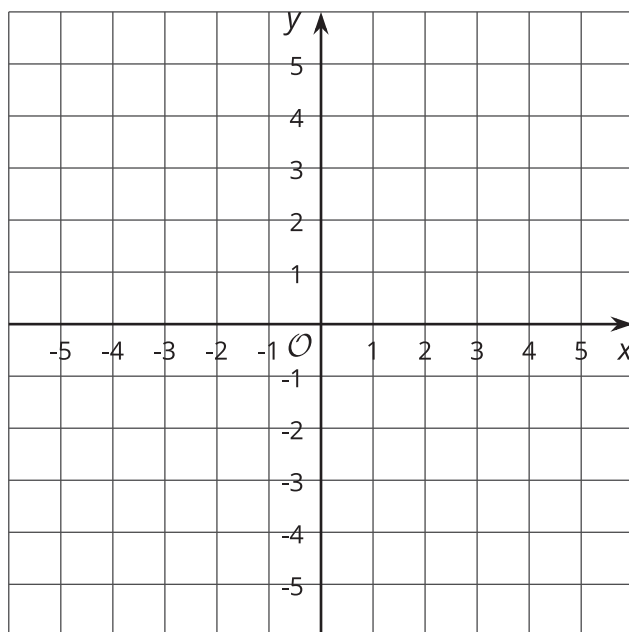


D



12.2

All the Same



- Plot at least 10 points whose y -coordinate is -4 . What do you notice about them?
- Which equation makes the most sense to represent all of the points with y -coordinate -4 ? Explain how you know.
 $x = -4$ $y = -4x$ $y = -4$ $x + y = -4$
- Plot at least 10 points whose x -coordinate is 3 . What do you notice about them?
- Which equation makes the most sense to represent all of the points with x -coordinate 3 ? Explain how you know.
 $x = 3$ $y = 3x$ $y = 3$ $x + y = 3$
- Graph the equation $x = -2$.
- Graph the equation $y = 5$.



Are you ready for more?

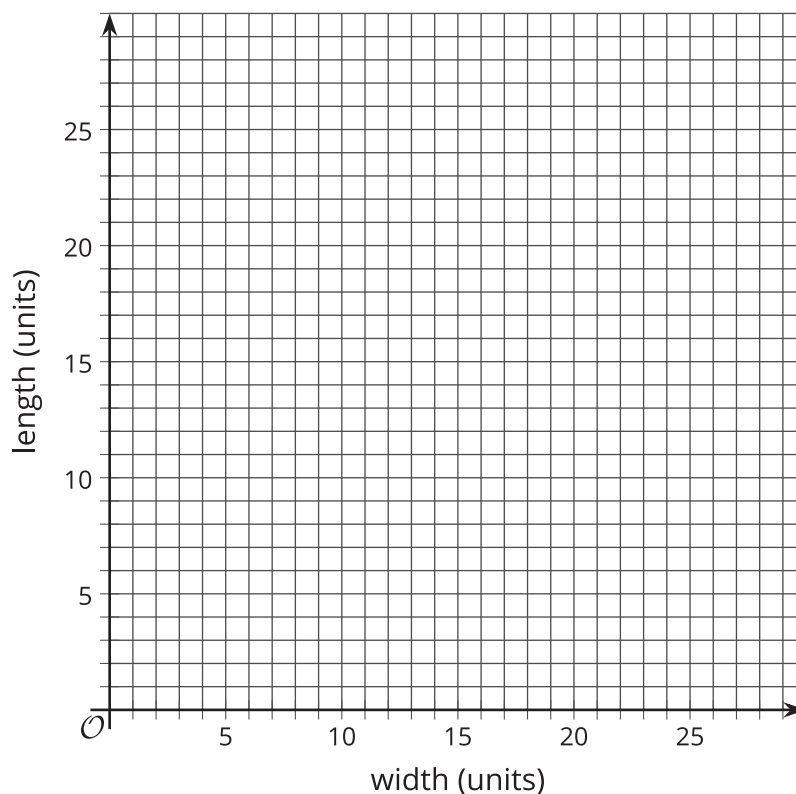
1. Draw the rectangle with vertices $(2, 1)$, $(5, 1)$, $(5, 3)$, and $(2, 3)$.
2. For each of the four sides of the rectangle, write an equation for a line containing the side.
3. A rectangle has sides on the graphs of $x = -1$, $x = 3$, $y = -1$, $y = 1$. Find the coordinates of each vertex.

12.3 Same Perimeter

- There are many possible rectangles whose perimeter is 50 units. Complete the table with lengths, ℓ , and widths, w , of at least 10 such rectangles.

w										
ℓ										

- On the graph, plot the length and width of rectangles whose perimeter is 50 units using the values from your table. Using a straightedge, draw the line that passes through these points.

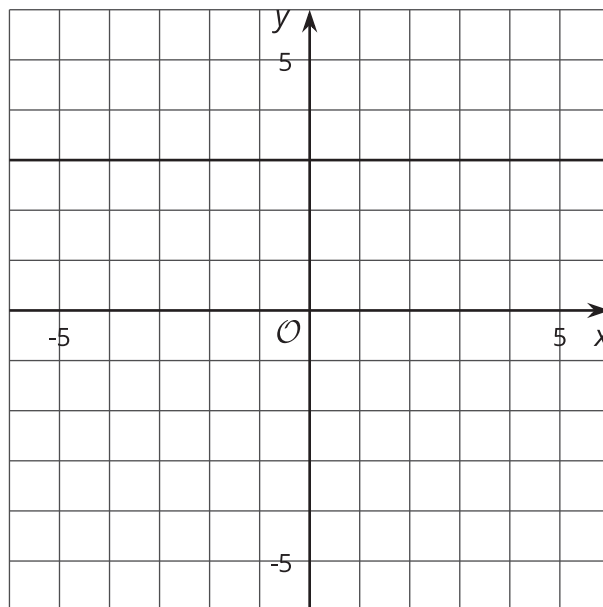


- What is the slope of this line? What does the slope mean in this situation?
- Write an equation for this line.

Lesson 12 Summary

Horizontal lines in the coordinate plane represent situations where the y -value doesn't change at all while the x -value changes.

The horizontal line that goes through the point $(0, 3)$ can be described by saying that “for all points on the line, the y -value is always 3.” Since horizontal lines are neither increasing or decreasing, they have a slope of 0, and so an equation for this horizontal line is $y = 0x + 3$, or just $y = 3$.



Vertical lines in the coordinate plane represent situations where the x -value doesn't change at all while the y -value changes.

The vertical line that goes through the point $(-2, 0)$ can be described by saying that “for all points on the line, the x -value is always -2.” An equation that says the same thing is $x = -2$.

