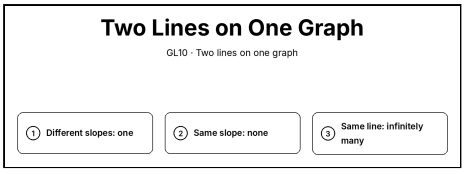
Two Lines on One Graph: teacher script

GL10-V1 · GL10 Two lines on one graph · teachers only. Without a screen, read each Say line and draw each Draw step on the board. About 63 seconds as a video.

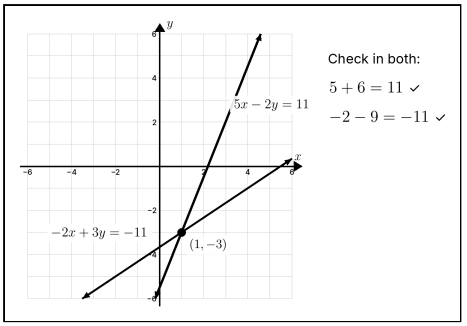
01



Say. Two lines on one graph. Different slopes: one solution. Same slope, different intercepts: none. Same line: infinitely many.

Draw. Write the title “Two Lines on One Graph” and the steps: 1. Different slopes: one; 2. Same slope: none; 3. Same line: infinitely many.

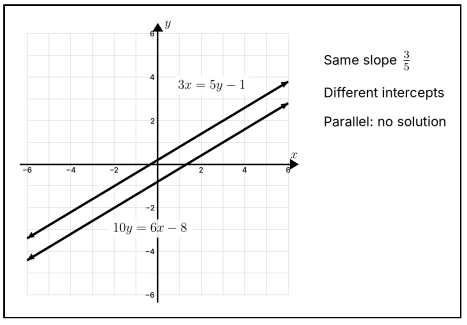
02



Say. Graph 5 x minus 2 y equals 11, and negative 2 x plus 3 y equals negative 11. They cross at 1, negative 3. A graph is only a guide, so check it in both equations: both come out true.

Draw. Clear the board and draw a grid with axes from -6 to 6. Plot (1, -3) and label it “(1, −3)”. Draw the line 5x − 2y = 11, labelled “5x − 2y = 11”. Draw the line −2x + 3y = −11, labelled “−2x + 3y = −11”. Beside the grid, write “Check in both:”. Beside the grid, write “5 + 6 = 11 ✓”. Beside the grid, write “−2 − 9 = −11 ✓”.

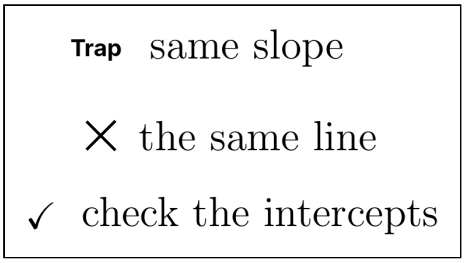
03



Say. These two both have slope 3 fifths, but different intercepts. They are parallel, and never meet: no solution.

Draw. Clear the board and draw a grid with axes from -6 to 6. Draw the line 3x − 5y = −1, labelled “3x = 5y − 1”. Draw the line 6x − 10y = 8, labelled “10y = 6x − 8”. Beside the grid, write “Same slope 3/5”. Beside the grid, write “Different intercepts”. Beside the grid, write “Parallel: no solution”.

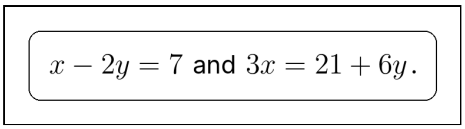
04



Say. Watch for the trap: thinking the same slope always means the same line. Check the intercepts.

Draw. Clear the board. Write “Trap” and same slope. Below, write the same line and cross it out ×. Then write check the intercepts with a tick ✓.

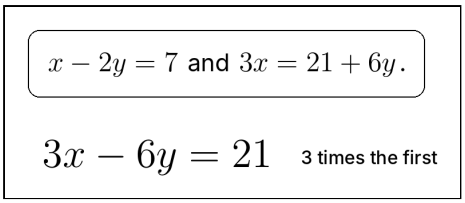
05



Say. x minus 2 y equals 7, and 3 x equals 21 plus 6 y.

Draw. Clear the board. Write “x − 2y = 7 and 3x = 21 + 6y.” in a box at the top.

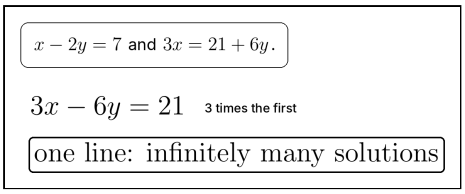
06



Say. Rearrange the second: 3 x minus 6 y equals 21. That is 3 times the first equation.

Draw. Write 3x − 6y = 21 on the next line. Beside it, write “3 times the first”.

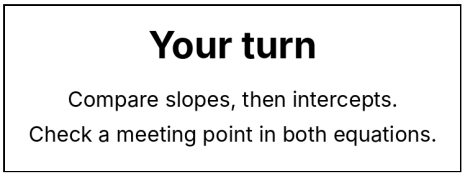
07



Say. So the two graphs are one line, and there are infinitely many solutions.

Draw. Write one line: infinitely many solutions and box it on the next line.

08



Say. Now it is your turn. Compare the slopes, then the intercepts.

Draw. Point to today’s activity: Compare slopes, then intercepts. Check a meeting point in both equations.