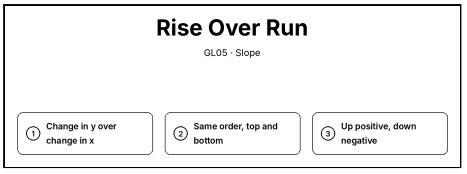
Rise Over Run: teacher script

GL05-V1 · GL05 Slope · teachers only. Without a screen, read each Say line and draw each Draw step on the board. About 65 seconds as a video.

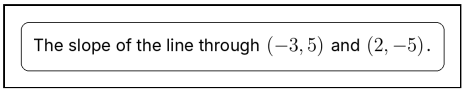
01



Say. Slope. Divide the change in y by the change in x. Keep the same order on top and underneath. Up is positive, and down negative.

Draw. Write the title “Rise Over Run” and the steps: 1. Change in y over change in x; 2. Same order, top and bottom; 3. Up positive, down negative.

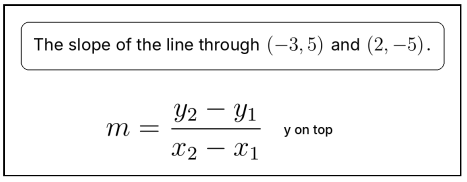
02



Say. Find the slope of the line through negative 3, 5 and 2, negative 5.

Draw. Clear the board. Write “The slope of the line through (−3, 5) and (2, −5).” in a box at the top.

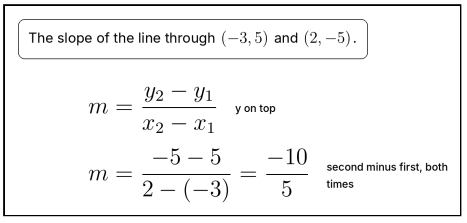
03



Say. The change in y goes on top, the change in x underneath.

Draw. Write m = (y_2 − y_1)/(x_2 − x_1) on the next line. Beside it, write “y on top”.

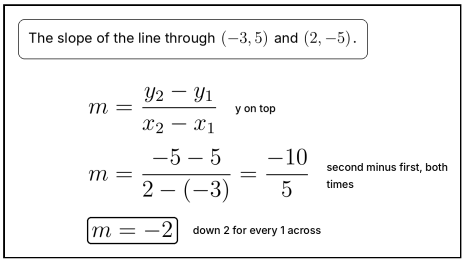
04



Say. Take the second point minus the first, on top and underneath: negative 5 minus 5, over 2 minus negative 3.

Draw. Write m = (−5 − 5)/(2 − (−3)) = (−10)/5 on the next line. Beside it, write “second minus first, both times”.

05



Say. That is negative 10 over 5: the slope is negative 2. The line goes down 2 for every 1 to the right.

Draw. Write m = −2 and box it on the next line. Beside it, write “down 2 for every 1 across”.

06

Trap $(-3, 5) \to (2, -5)$

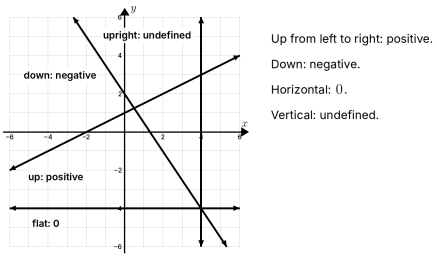
$$\times \ \frac{2-(-3)}{-5-5} = -\frac{1}{2}$$

$$\checkmark \ \frac{-5-5}{2-(-3)} = -2$$

Say. Watch for the trap: a slope upside down. Change in y on top.

Draw. Clear the board. Write “Trap” and (−3, 5) \to (2, −5). Below, write (2 − (−3))/(−5 − 5) = −1/2 and cross it out ×. Then write (−5 − 5)/(2 − (−3)) = −2 with a tick ✓.

07



Say. A line that goes up from left to right has a positive slope. One that goes down has a negative slope. A horizontal line has slope 0, and a vertical line has no slope at all: it is undefined, because you can't divide by 0.

Draw. Clear the board and draw a grid with axes from -6 to 6. Draw the line x − 2y = −2, labelled “up: positive”. Draw the line 3x + 2y = 4, labelled “down: negative”. Draw the line y = −4, labelled “flat: 0”. Draw the line x = 4, labelled “upright: undefined”. Beside the grid, write “Up from left to right: positive.”. Beside the grid, write “Down: negative.”. Beside the grid, write “Horizontal: 0.”. Beside the grid, write “Vertical: undefined.”.

08

Your turn

Change in y over change in x.
Same order on top and underneath.

Say. Now it is your turn. Change in y over change in x, in the same order.

Draw. Point to today’s activity: Change in y over change in x. Same order on top and underneath.