4.5 Slope and *y*-Intercept

TEKS **A.3.B, A.6.A, A.6.E**

QUESTION How can you use the equation of a line to find its slope and *y*-intercept?

EXPLORE Find the slopes and the *y*-intercepts of lines

STEP 1 *Find y when x = 0*
Copy the table below. Let $x_1 = 0$ and find y_1 for each equation. Use your answers to complete the second and fifth columns in the table.

STEP 2 *Find y when x = 2*
Let $x_2 = 2$ and find y_2 for each equation. Use your answers to complete the third column in the table.

STEP 3 *Compute the slope*
Use the slope formula and the ordered pairs you found in the second and third columns to complete the fourth column.

Line	$(0, y_1)$	$(2, y_2)$	Slope	*y*-intercept
$y = 4x + 3$	(0, 3)	(2, 11)	$\frac{11 - 3}{2 - 0} = 4$	3
$y = -2x + 3$	(0, ?)	(2, ?)	?	?
$y = \frac{1}{2}x + 4$	(0, ?)	(2, ?)	?	?
$y = -4x - 3$	(0, ?)	(2, ?)	?	?
$y = -\frac{1}{4}x - 3$	(0, ?)	(2, ?)	?	?

DRAW CONCLUSIONS Use your observations to complete these exercises

1. *Compare* the slope of each line with the equation of the line. What do you notice?

2. *Compare* the *y*-intercept of each line with the equation of the line. What do you notice?

Predict the slope and the *y*-intercept of the line with the given equation. Then check your predictions by finding the slope and *y*-intercept as you did in the table above.

3. $y = -5x + 1$ 4. $y = \frac{3}{4}x + 2$ 5. $y = -\frac{3}{2}x - 1$

6. **REASONING** Use the procedure you followed to complete the table above to show that the *y*-intercept of the graph of $y = mx + b$ is b and the slope of the graph is m.