

Unit 2: Graphing

Part 3: Slope-Intercept Form

SWBAT graph and write lines in slope-intercept form.

Assignments:

HW16

Review: Equations of Lines

- ▶ Graphs are a picture of all the solutions to an equation with 2 (or more) variables
- ▶ Recall: what two things do we need to have to graph a line?
 - ▶ Point
 - ▶ Slope
- ▶ Point-Slope Form:
 - ▶ $y - y_1 = m(x - x_1)$

Equations of Lines

▶ *Slope-Intercept Form*

▶ $y = mx + b$

Slope



y-coordinate of **y-intercept**
y-intercept is $(0, b)$

y-intercept: the point where the graph crosses the y-axis

Identify the slope and y-intercept

▶ $y = 2x + 1$

▶ $y = -\frac{1}{4}x - 7$

1. $y = 3x - 2$

2. $y = \frac{1}{2}x + 9$

3. $y = -\frac{4}{5}x - 19$

4. $y = -15x + 29$

5. $y = -2x - 12$

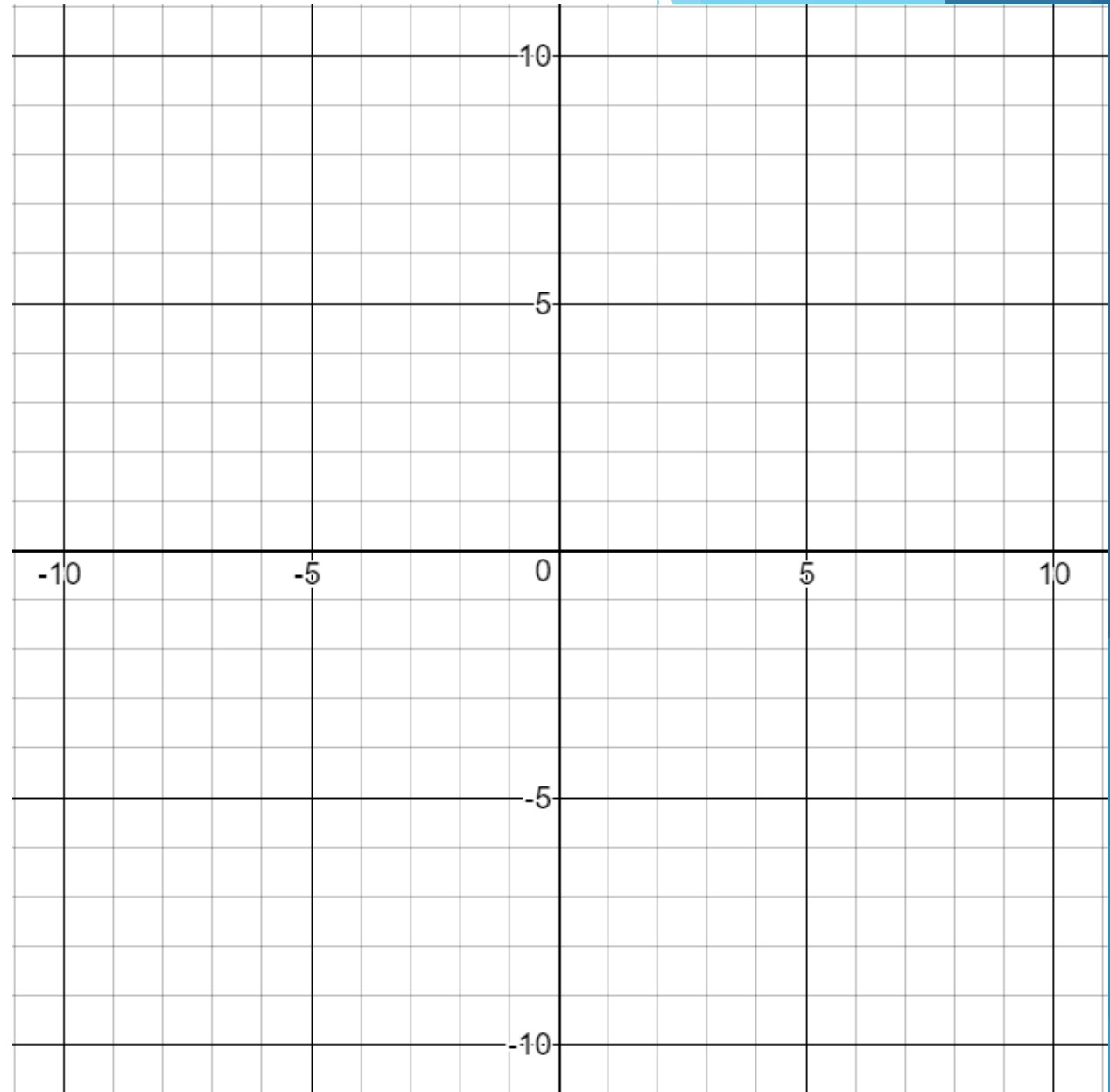
6. $y = 24 - 2x$

7. $y = 4 + \frac{1}{2}x$

8. $y = 6$

Graphing Equations in Slope-Intercept Form

- ▶ Example: $y = 3x - 2$
1. Identify slope and y-intercept
 2. Plot the y-intercept.
 3. Use the slope to find your next point.
 4. Repeat step 3.
 5. Draw a straight line through your points.



Graph the equations

No more than 3 lines per grid

► $y = -2x - 3$

1. $y = -2x - 7$

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

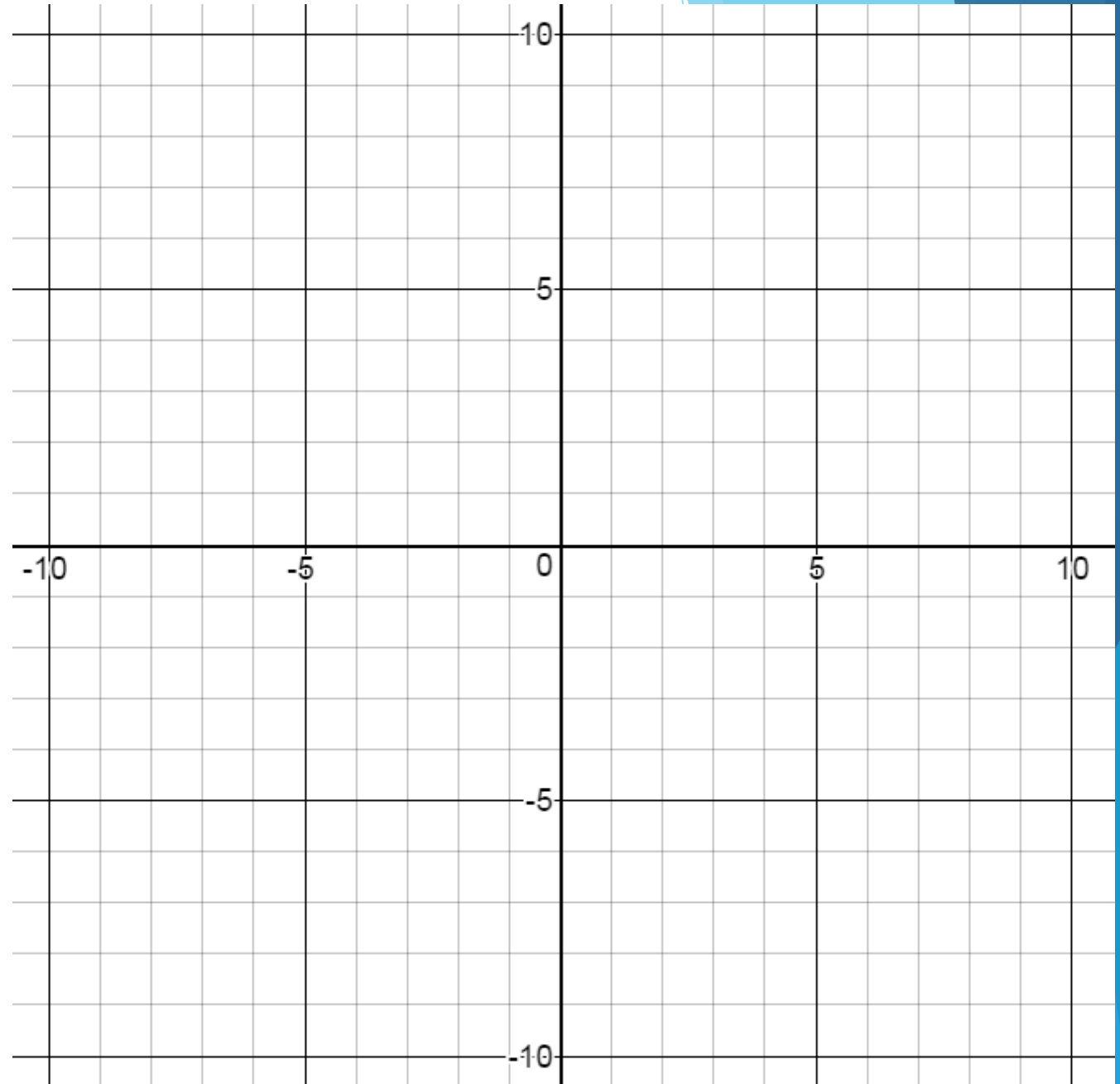
3. $y = x - 10$

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

5. $y = \frac{3}{4}x$

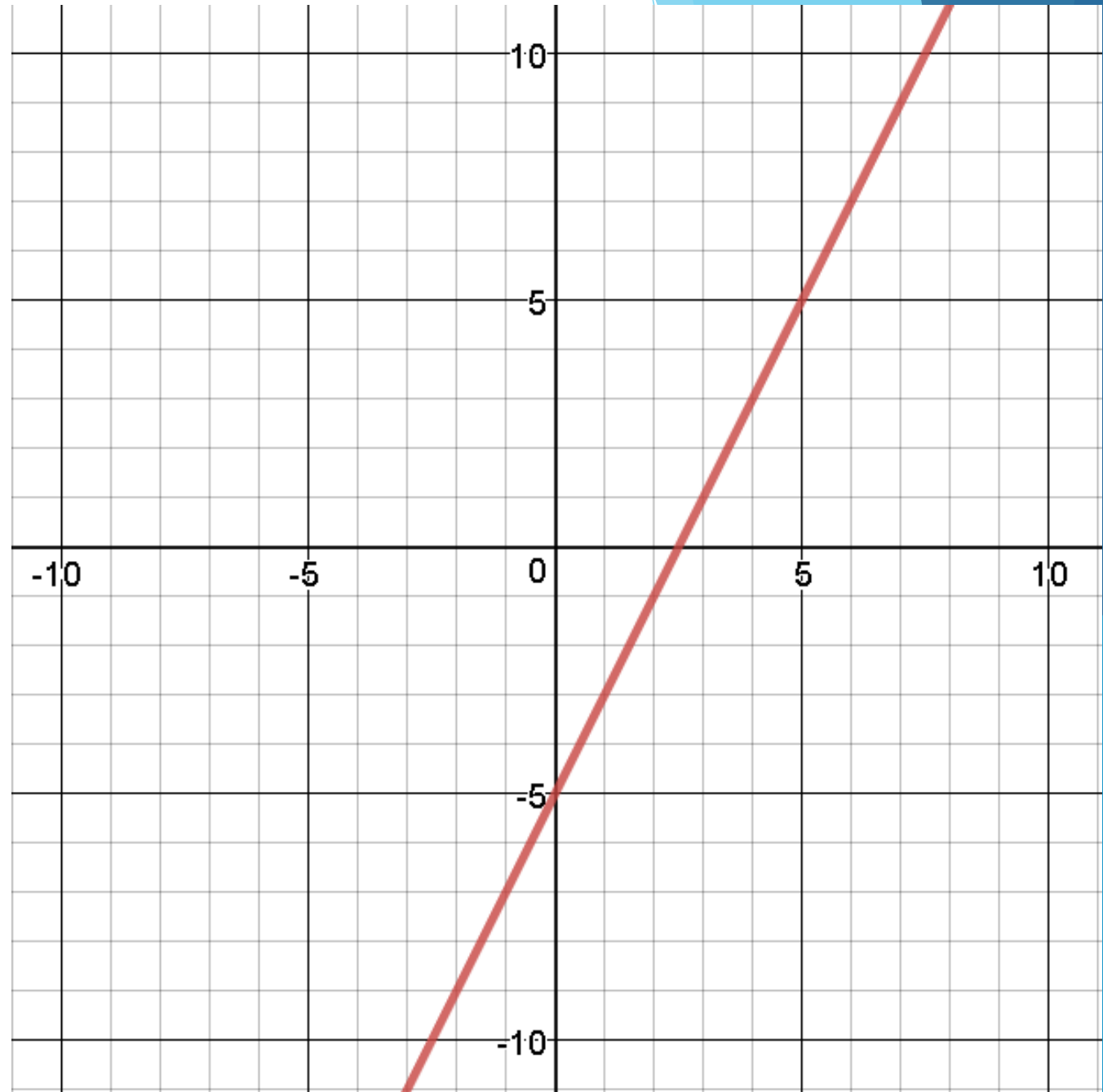
6. $y = 4$

7. $x = 9$



Writing the Equation

- ▶ We need the same two things to write the equation of a line as we do to graph it
 - ▶ Write the equation of the line in slope-intercept form.
1. Slope $m = -2$; y-intercept $(0,7)$



Writing Equations of Lines: Slope-Intercept

▶ What if we're given a random point and the slope?

1. Write in point-slope form
2. Simplify right-hand side
3. Solve for y

▶ through $(9,5)$; slope = 3

▶ through $(2, -1)$; slope = 7

Writing Equations of Lines: Parallel Lines

- ▶ Through $(-21, -1)$; parallel to $y = 8x - 7$
- ▶ Parallel Lines have the *same* slopes
- ▶ Through $(0, 6)$; parallel to $y = 2x + 1$

Writing Equations of Lines: Perpendicular

▶ through $(-21, -1)$; perpendicular to $y = 8x - 7$

▶ Perpendicular Lines have *opposite reciprocal* slopes

▶ Through $(0, 6)$; perpendicular to $y = 2x + 1$