Section 2.3 Guided Notebook

Section 2.3 Lines

- ☐ Work through Objective 1
- ☐ Work through Objective 2
- ☐ Work through Objective 3
- ☐ Work through Objective 4
- ☐ Work through Objective 5
- ☐ Work through Objective 6
- ☐ Work through Objective 7
- ☐ Work through Objective 8

Section 2.3 Lines

Section 2.3 Objective 1 Determining the Slope of a Line

Watch the video that accompanies Objective 1.

Write down the **definition of slope** here:

Work through the **Guided Visualization** titled "Determining the Slope of a Line" found on the bottom of page 2.3-4. Then draw 4 lines below. One line should have positive slope, one line should have negative slope, one line should have zero slope, and one line should have undefined slope.

Work through Example 1: Find the slope of the line that passes through the indicated ordered pairs.

a. $(6,-4)$ and $(-5,1)$

b. $(3,-1)$ and $(3,6)$

c. $(-5,4)$ and $(-2,4)$

Section 2.3 Objective 2 Sketching a Line Given a Point and the Slope

Work through the video that accompanies Example 2 and take notes here:

Sketch the line with slope $m=\frac{2}{3}$ that passes through the point $(-1,-4)$. Also, find three more points located on the line.

Section 2.3 Objective 3 Finding the Equation of a Line Using the Point-Slope Form

Watch the video that accompanies Objective 3 to see how to derive the Point-Slope Form of the equation of a line and take notes here:

Write down the **Point-Slope Form** of a line here:

Work through Example 3 and take notes here:

Find an equation in point-slope form of the line with slope $m = \frac{2}{3}$ that passes through the point $(-1, -4)$.

Work through the **Guided Visualization** titled "Equations of Lines: Point-Slope" seen on the bottom of page 2.3-9. Draw a line below that passes through the point $(-1, -4)$ with slope $m = -2$. According the **Guided Visualization,** what is the equation of that line?

Section 2.3 Objective 4 Finding the Equation of a Line Using the Slope-Intercept Form

In Example 3 from the previous page, you should have found the equation of the line to be $y+4=\frac{2}{3}(x+1)$. Try solving this equation for *y*. What do you get?

Now, write down the **Slope-Intercept Form** of the equation of a line here:

Work through the video that accompanies Example 4 and take notes here:

Find the equation of the line with slope $\frac{1}{4}$ and *y*-intercept 3, and write your answer in slope-intercept form.

Work through the **Guided Visualization** titled "Equations of Lines: Slope-Intercept" seen on the bottom of page 2.3-14. Draw a line below that passes through the point $(0,-4)$ with slope $m=-3$. According the **Guided Visualization,** what is the equation of that line?

Section 2.3 Objective 5 Writing the Equation of a Line in Standard Form

Write down the **Standard Form Equation of a Line** here:

Write down the **Tip** seen on page 2.3-16:

Work through the **Guided Visualization** titled "Equations of Lines: Standard Form" seen on the bottom of page 2.3-16. Draw a line below with $A = 1$, $B = 3$, and $C = -6$. According the **Guided Visualization,** what is the equation of that line?

Work through the video that accompanies Example 5 and take notes here:
Find the equation of the line passing through the points $(-1,3)$ and $(2,-4)$. Write the equation in point-slope form, slope-intercept form, and standard form.

Make sure that you know how to write an equation of a line in point-slope form, slope-intercept form, and standard form! Write the point-slope, slope-intercept, and standard forms here:

Point-Slope Form:

Slope-Intercept Form:

Standard Form:

Section 2.3 Objective 6 Finding the Slope and y-Intercept of a Line in Standard Form

Watch the video that accompanies Objective 6 and take notes here:

Given a line of the form $Ax + By = C,\ B \neq 0$ what is the slope of this line and what is the y-intercept?

Slope = _____ and y-intercept = _____

Work through the video that accompanies Example 6 and take notes here:
Find the slope and *y*-intercept and sketch the line $3x - 2y = 6$.

Section 2.3 Objective 7 Sketching Lines by Plotting Intercepts

Watch the video that accompanies Example 7 and take notes here:

Sketch the line $2x-5y=8$ by plotting intercepts.

What is the definition of an ***x*-intercept**?

What is the definition of a ***y*-intercept**?

Section 2.3 Objective 8 Finding the Equations of Horizontal and Vertical Lines

Horizontal Lines: Watch the video that describes the equation of a horizontal line and take notes here:

What is the slope of every horizontal line?

What is the equation of a horizontal line?

Vertical Lines: Watch the video that describes the equation of a vertical line and take notes here:

Does a vertical line have slope?

What is the equation of a vertical line?

Watch the video that accompanies Example 8 and take notes here:
a. Find the equation of the horizontal line passing through the point $(-1,3)$.

b. Find the equation of the vertical line passing through the point $(-1,3)$.

Before going on to Section 2.4, you may want to write all of the different types of equations of lines for future reference. These forms are summarized at the end of Section 2.3 in your eText.

Point-Slope Form

Slope-Intercept Form

Standard Form

Horizontal Line

Vertical Line