Answers for the problems in the presentation:

Find the slope: Use the slope formula.

1. $(4, 5)\, and\, (-2, 8)$

$$m = \frac{8-5}{-2-5} = \frac{3}{-7} = -\frac{3}{7}$$

2. $(-3, -1)\, and\, (5, 7)$

$$m = \frac{7-(-1)}{5-(-3)} = \frac{7+1}{5+3} = \frac{8}{8} = 1$$

Write the equation of a line with the given information: Simply substitute.

1. $y = 3x - 1$

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

      Show students both ways; substituting into slope-intercept form and solving for the y intercept and substituting into point-slope form and converting to slope-intercept form; using same set of points so they can see that no matter which method they chose, their final equation in slope-intercept form would be the same.

Write the equation of a line given two points.

3. $(2, 8)\, and\, (-5, 1)$

$$m = \frac{1-8}{-5-2} = \frac{-7}{-7} = 1$$

$8 = 1(2) + b$

$8 = 2 + b$

$-2\ \ -2$

$6 = b$

$y = x + 6$

$y - 8 = 1(x - 2)$

$y - 8 = x - 2$

$\quad\ +8 \quad\ +8$

$y = x + 6$

4.

$(-7, 3)\ and\ (-4, 1)$

$$m = \frac{1-3}{-4-(-7)} = \frac{-2}{-4+7} = \frac{-2}{3} = -\frac{2}{3}$$

$$3 = -\frac{2}{3}(-7) + b$$

$$3 = -\frac{2}{3}(\frac{-7}{1}) + b$$

$$3 = \frac{14}{3} + b$$

$$-\frac{14}{3} \quad -\frac{14}{3}$$

$$\frac{9}{3} - \frac{14}{3} = b$$

$$-\frac{5}{3} = b$$

$$y = -\frac{2}{3}x - \frac{5}{3}$$

$$y - 3 = -\frac{2}{3}(x + 7)$$

$$y - 3 = -\frac{2}{3}x - \frac{2}{3}(\frac{7}{1})$$

$$y - 3 = -\frac{2}{3}x - \frac{14}{3}$$

$$+3 \qquad\qquad +3$$

$$y = -\frac{2}{3}x + \frac{9}{3} - \frac{14}{3}$$

$$y = -\frac{2}{3}x - \frac{5}{3}$$

5.

$(5, -6)\ and\ (-2, 1)$

$$m = \frac{-1-(-6)}{-2-5} = \frac{-1+6}{-7} = \frac{5}{-7} = -\frac{5}{7}$$

$$-6 = -\frac{5}{7}(5) + b$$

$$-6 = -\frac{5}{7}(\frac{5}{1}) + b$$

$$-6 = -\frac{25}{7} + b$$

$$+\frac{25}{7} \quad +\frac{25}{7}$$

$$y + 6 = -\frac{5}{7}(x - 5)$$

$$y + 6 = -\frac{5}{7}x + \frac{5}{7}(\frac{5}{1})$$

$$y + 6 = -\frac{5}{7}x + \frac{25}{7}$$

6.

$(2, 4)\,and\,(1, -2)$

$$m = \frac{-2-4}{1-2} = \frac{-6}{-1} = 6$$

$$4 = 6(2) + b$$

$$4 = 12 + b$$

$$-12 \quad -12$$

$$-8 = b$$

$$y = 6x - 8$$

$$y - 4 = 6(x - 2)$$

$$y - 4 = 6x - 12$$

$$+4 \qquad +4$$

$$y = 6x - 8$$

After showing the students how to do the problem and doing a few together, examples 1

through 6, show them the video from Khan Academy: *Slope-intercept equation from two*

solutions example. (Academy, 2011) This video is an example of how to write the equation of a

line in slope intercept form when given two points. The presenter in the video does a nice job of

briefly reviewing a prerequisite skill (slope formula, operations with signed numbers and

operations with fractions) before immediately applying the skill within the problem. After the

problem is introduced, pause the video and have the students try the problem. After giving them

a few minutes to complete it, play the video. At the end of the video, take a poll of the students

via the thumbs up/middle/down method.

  Continue to work through more examples together, at first telling the students which

method to use. This is to be sure they are familiar with both ways because they will need

flexibility in the future in this unit.

As the lesson progresses, allow the students to choose which method they like best.

7.

$$(5, -6) \text{ and } (-2, 1)$$

$$m = \frac{-1-(-6)}{-2-5} = \frac{-1+6}{-7} = \frac{5}{-7} = -\frac{5}{7}$$

$$-6 = -\frac{5}{7}(5) + b$$

$$-6 = -\frac{5}{7}\left(\frac{5}{1}\right) + b$$

$$-6 = -\frac{25}{7} + b$$

$$+\frac{25}{7} \qquad +\frac{25}{7}$$

$$-\frac{42}{7} + \frac{25}{7} = b$$

$$-\frac{17}{7} = b$$

$$y = -\frac{5}{7}x - \frac{17}{7}$$

$$y + 6 = -\frac{5}{7}(x - 5)$$

$$y + 6 = -\frac{5}{7}x + \frac{5}{7}(5)$$

$$y + 6 = -\frac{5}{7}x + \frac{5}{7}\left(\frac{5}{1}\right)$$

$$y + 6 = -\frac{5}{7}x + \frac{25}{7}$$

$$\quad -6 \qquad\qquad -6$$

$$y = -\frac{5}{7}x + \frac{25}{7} - \frac{42}{7}$$

$$y = -\frac{5}{7}x - \frac{17}{7}$$

8. $(-3, -5)$ and $(1, 9)$

$$m = \frac{9-(-5)}{1-(-3)} = \frac{9+5}{1+4} = \frac{14}{5}$$

$$-5 = \frac{14}{5}(-3) + b$$

$$-5 = \frac{14}{5}(\frac{-3}{1}) + b$$

$$-5 = \frac{-42}{5} + b$$

$$+\frac{42}{5} \qquad +\frac{42}{5}$$

$$\frac{-25}{5} + \frac{42}{5} = b$$

$$\frac{17}{5} = b$$

$$y = \frac{14}{5}x + \frac{17}{5}$$

$$y + 5 = \frac{14}{5}(x+3)$$

$$y + 5 = \frac{14}{5}x + \frac{42}{5}$$

$$-5 \qquad +5$$

$$y = \frac{14}{5}x + \frac{25}{5} + \frac{42}{5}$$

$$y = \frac{14}{5}x + \frac{17}{5}$$

9. $(-4, 6)\,and\,(5, 6)$

$$m = \frac{6-6}{5-(-4)} = \frac{0}{5+4} = \frac{0}{9} = 0$$

$6 = 0(-4) + b$

$6 = 0 + b$

$6 = b$

$y = 0x + 6$

$y = 6$

$y - 6 = 0(x + 4)$

$y - 6 = 0x + 0$

$y - 6 = 0$

$+6 \quad +6$

$y = 6$