Math 60, HW 20 Section 3.4 Name: _____

Concept and Vocabulary:

1. The slope-interept form of the equation of a line is _____, where m represents the _____ and b represents the _____.

2. In order to graph the line whose equation is $y = \frac{2}{5}x + 3$, begin by plotting the point _____. From this point, we move _____ units up (the rise) and _____ units to the right (the run).

3. In order to graph equations of the form $Ax + By = C$ using the slope and y-intercept, we begin by solving the equation for _____.

Practice Exercises:

In exercises 1 - 11 odd, find the slope and y-intercept of the line with the given equation.

1. $y = 3x + 2$

3. $y = 3x - 5$

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

7. $y = 7x$

9. $y = 10$

11. $y = 4 - x$

In exercises 13 - 25 odd, begin by solving the linear equation for y. This will put the equation in slope-intercept form. Then find the slope and the y-intercept of the line with this equation.

13. $-5x + y = 7$

15. $x + y = 6$

17. $6x + y = 0$

19. $3y = 6x$

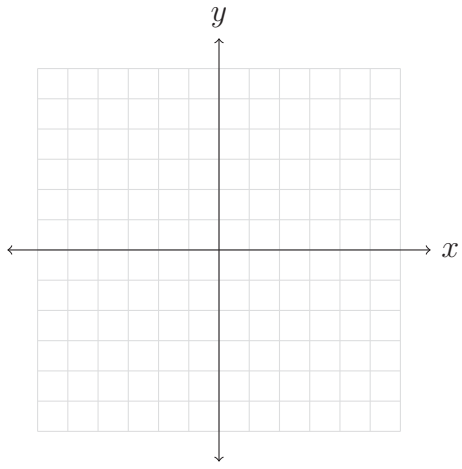
21. $2x + 7y = 0$

23. $3x + 2y = 3$

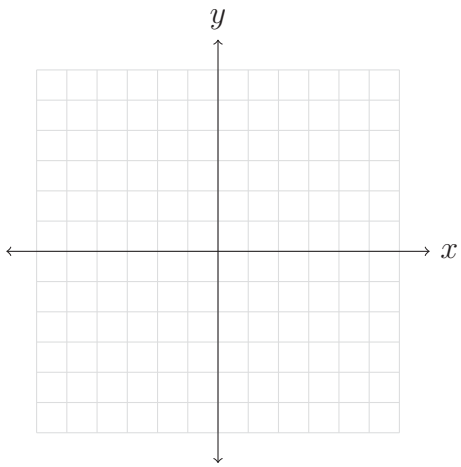
25. $3x - 4y = 12$

In exercises 27 - 37 odd, graph each linear equation using the slope and y-intercept.

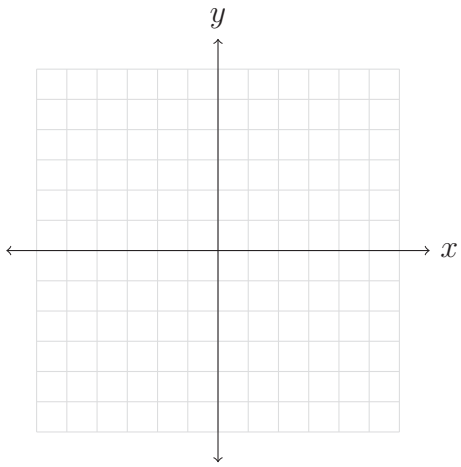
27. $y = 2x + 4$



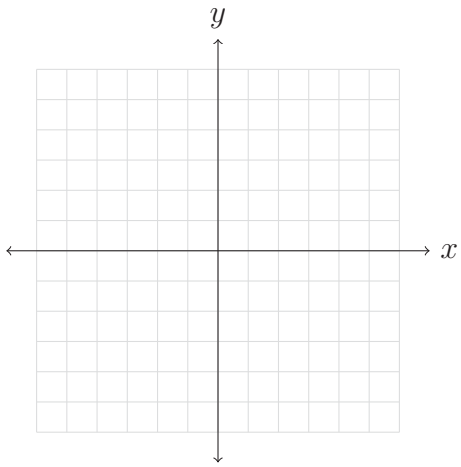
29. $y = -3x + 5$



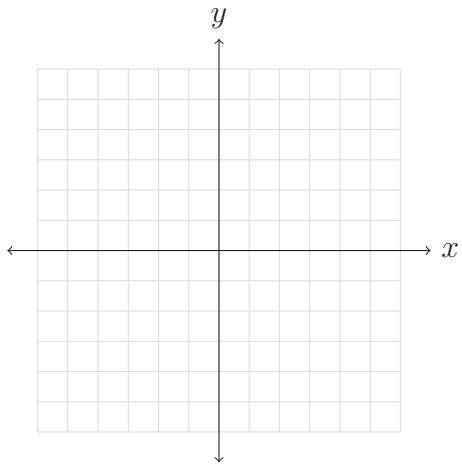
31. $y = \frac{1}{2}x + 1$



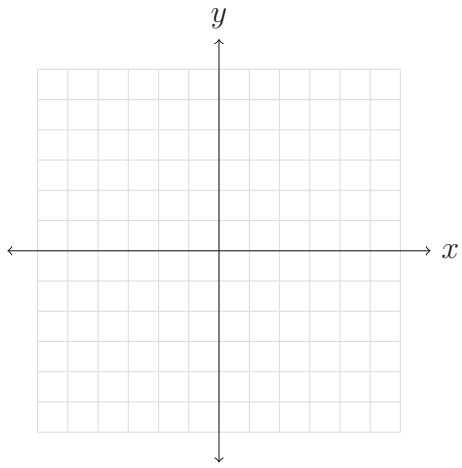
33. $y = \frac{2}{3}x - 5$



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



37) $y = -\frac{5}{3}x$



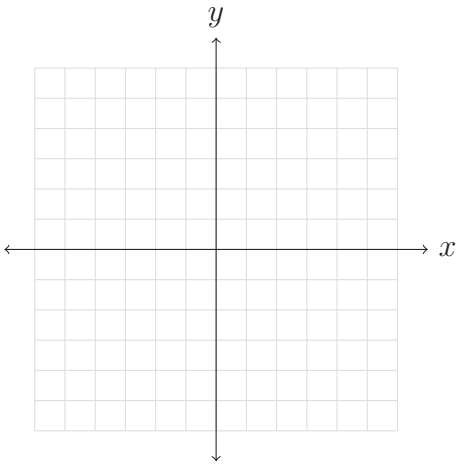
In exercises 39 - 45 odd, put the equation in slope-intercept form, identify the slope and y-intercept, and use the slope and y-intercept to graph the equation.

39. $3x + y = 0$

    a. Put the equation in slope-intercept form by solving for y.

    b. Identify the slope and the y-intercept.

    c. Use the slope and y-intercept to graph the equation.

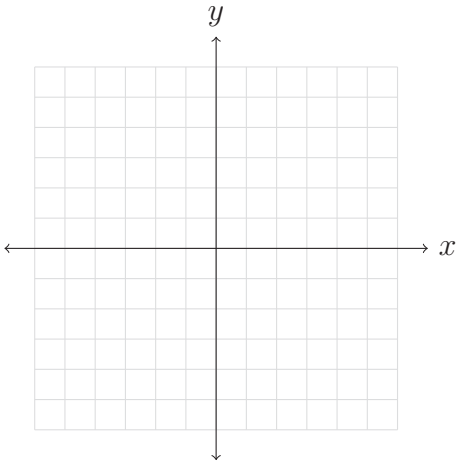


41. $3y = 4x$

    a. Put the equation in slope-intercept form by solving for y.

    b. Identify the slope and the y-intercept.

    c. Use the slope and y-intercept to graph the equation.

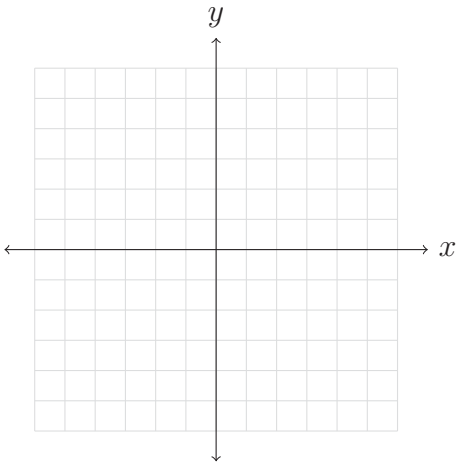


43. $2x + y = 3$

a. Put the equation in slope-intercept form by solving for y.

b. Identify the slope and the y-intercept.

c. Use the slope and y-intercept to graph the equation.

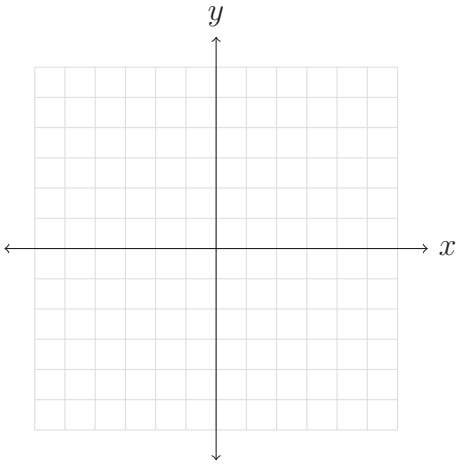


45. $7x + 2y = 14$

a. Put the equation in slope-intercept form by solving for y.

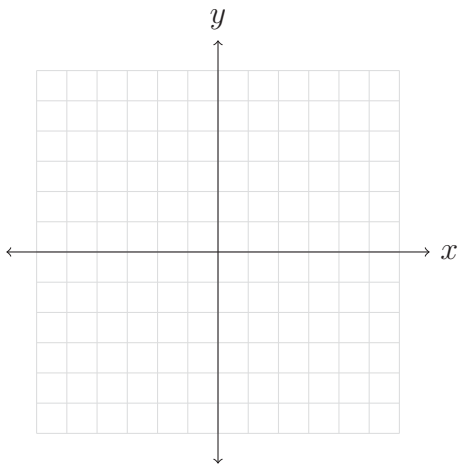
b. Identify the slope and the y-intercept.

c. Use the slope and y-intercept to graph the equation.

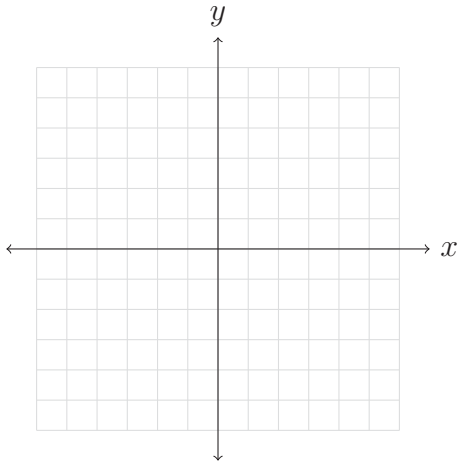


In exercises 47 - 55, graph both linear equations in the same rectangular coordinate system.

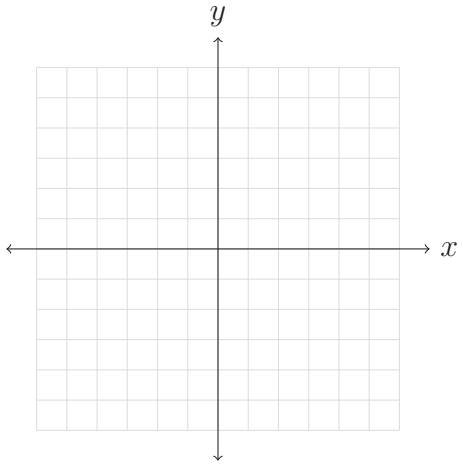
47. $y = 3x + 1$ $y = 3x - 3$



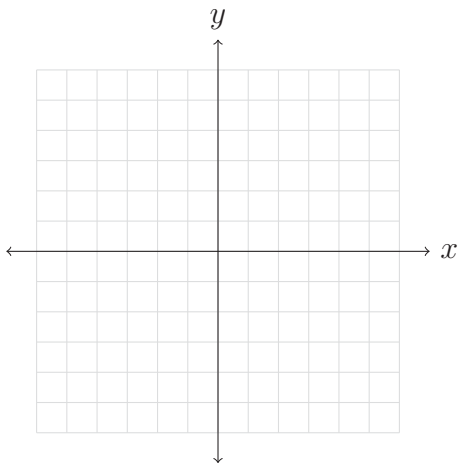
49. $y = -3x + 2$ $y = 3x + 2$



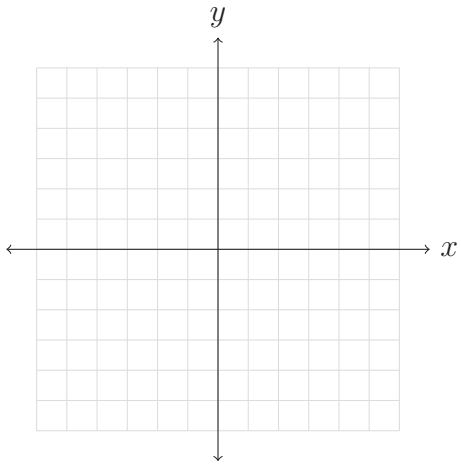
51. $y = x + 3$ $y = -x + 1$



53. $x - 2y = 2$ $2x - 4y = 3$



55. $2x - y = -1$ $x + 2y = -6$



Applications:

65. The bar graph shown in the text shows the racial and ethnic composition of the United States population in 2008, with projections for 2050.

    a. Use the two points for white non-Hispanics to find an equation in the form $y = mx + b$ that models the percentage of white non-Hispanics, y, in the United States population x years after 2008. Round m to two decimal places.

    b. Use the model from part (a) to project the percentage of white non-Hispanics in the United States in 2108.

SUPPLEMENT TO §3.4

1. For the following equations, state what the slope and y-intercept are and then use that slope and y-intercept to graph the solutions to the equation in the space provided. Label the y-intercept and label the graph with its corresponding equation. You will need to choose an appropriate scale for the grid on the coordinate plane.

   a. $y = 6x + 30$

   b. $y = -50x + 250$

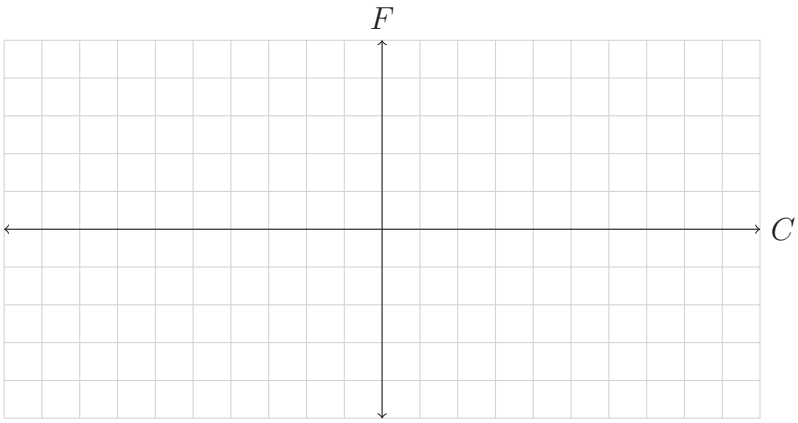
   c. $y = \frac{1}{12}x - 4$

   d. $y = -\frac{25}{4}x + 25$

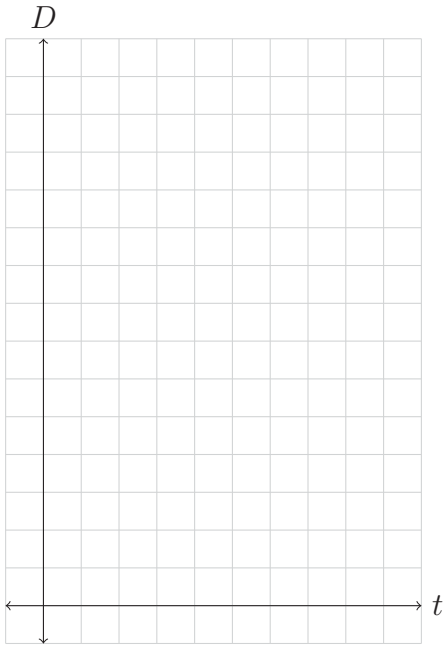
2. The linear equation

$$F = \frac{9}{5}C + 32$$

models the temperature in degrees Fahrenheit, F, given the temperature in degrees Celsius, C. Graph the equation in the provided coordinate plane. You will need to set up an appropriate scale on the coordinate plane for your graph to fit properly. Label the C- and F-intercepts and the equation of the line.

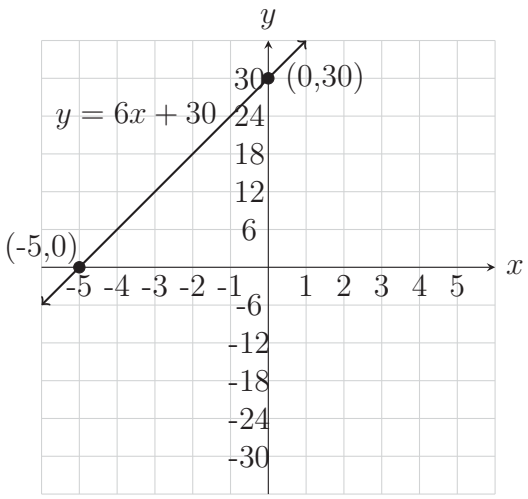


3. You're leaving Eugene from a Ducks game and driving back home to Portland. Eugene is about 104 miles from Portland and the traffic keeps you driving an average of 52 miles per hour. Model an equation which gives the distance, D, you are from home t hours after leaving Eugene and then graph that equation in the provided coordinate plane. You will need to set up an appropriate scale on the coordinate plane for your graph to fit properly. Label the t- and D-intercepts and the equation of the line.

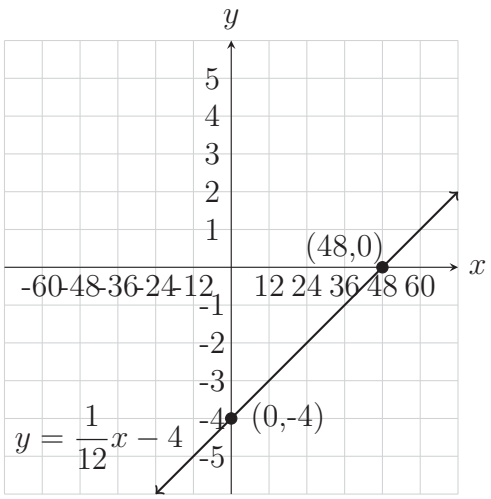


ANSWERS TO SUPPLEMENT §3.4**:**

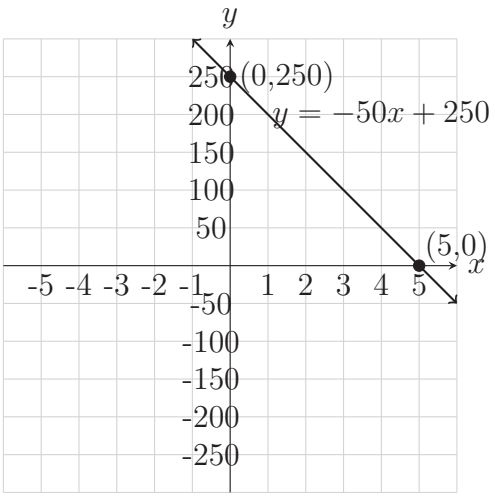
1. a.



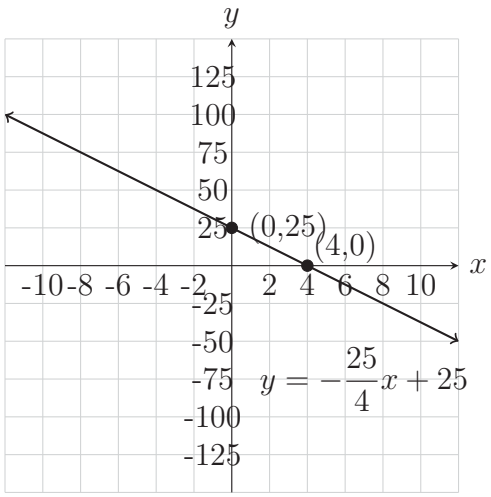
c.



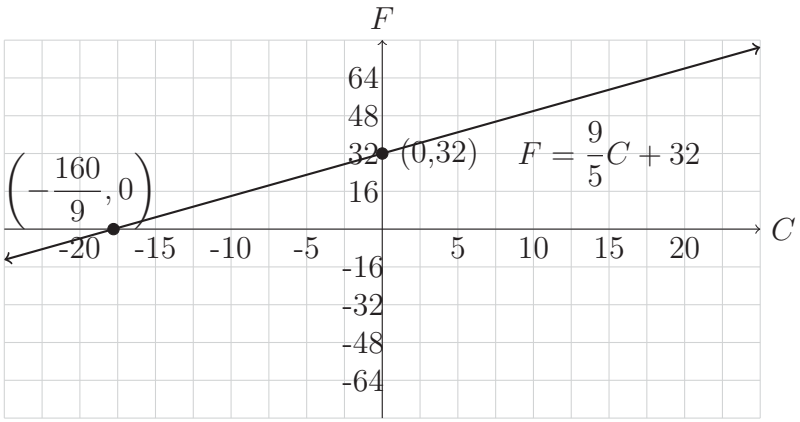
b.



d.



2. The F-intercept is $(0, 32)$ and the slope is $m = \dfrac{9}{5}$.



3. The D-intercept is $(0, 104)$ since you are 104 miles from Portland when you start driving. You're getting closer to Portland so your distance is decreasing at a rate of 52 miles per hour thus the slope is -52. Hence the equation which models your distance from Portland given the number of hours you've been driving is

$$D = -52t + 104.$$