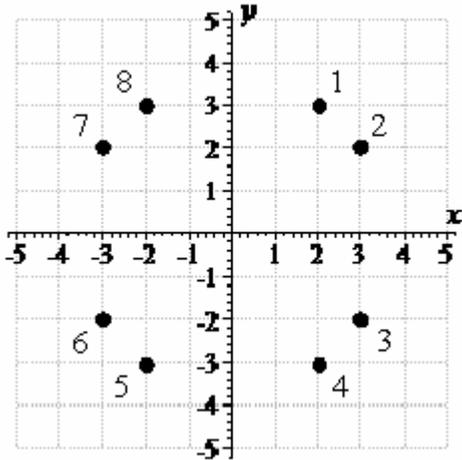


## Practice Problems for MTE 5 – Linear Equations, Inequalities, and Systems of Equations in Two Variables

1. Determine the coordinates of the point labeled 7



2. Determine which of the ordered pairs is a solution of the equation.

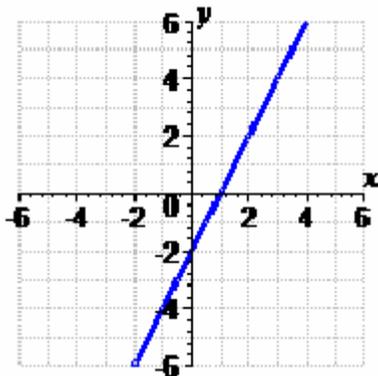
$$x + 5y + 10 = 0$$

- a) (-3,4)   b) (0,-2)   c) (-5,10)   d) (4,-5)

3. Graph the linear equation by completing the table.

$x$	-2	-1	0	1	2
$y = -2x + 1$					

4. Evaluate  $f(x) = 2x - 1$  at  $x = 6$ .  
 5. Estimate the  $x$ - and  $y$ -intercepts of the graph.



6. Graph the linear equation by plotting the  $x$ - and  $y$ -intercepts.  $-2x + 4y - 16 = 0$ .

7. Sketch the graph of the equation  $y = \frac{2}{3}x + 2$  and label three points on the graph.

8. Graph.  $y = 4$

9. Graph.  $x = -3$

10. Sketch the graph of the linear inequality.

$$3x - 2y \geq 6$$

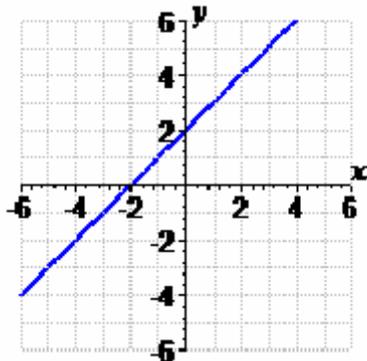
11. Find the slope (if possible) of the line passing through the points (4, 7) and (5, 10).

12. Find the slope of the graph of the equation  $y = -\frac{1}{6}x + 1$ .

13. Find the slope of the graph of the equation by converting to slope-intercept form.

$$5x + 8y = -7$$

14. Find the slope of the given line.



15. Find the slope of  $x = -8$ , if possible

16. Find the slope of  $y = 3$ , if possible

17. Write the equation of the line that passes through the point  $\left(0, -\frac{4}{9}\right)$  and has slope  $m = -\frac{9}{7}$ .

Write the equation in slope-intercept form.

18. Write the equation of the line that passes through the point (5, -5) and has slope  $m = -5$ . Write the equation in slope-intercept form.

19. Write an equation of the line that passes through the points (-1, -10) and (-5, 2). Write the equation in slope-intercept form.

20. Write an equation of a line passing through the points (-5, 7) and (-5, 2).

21. Write an equation of a line passing through the points (1, 2) and (14, 2).

22. Write an equation of the line through the point (4, -2) that is parallel to the line  $-5x + 6y = -2$ .

23. Write an equation of the line through the point (5, 3) that is perpendicular to the line  $-3x + 7y = 5$ .

24. Determine whether (-4, 6), (7, -4), (-4, 5), (-1, -1), or (5, 8) is a solution of the system of equations below.

$$\begin{cases} 4x + 7y = 0 \\ 2x + 9y = -22 \end{cases}$$

25. Sketch the graphs of the equations  $\begin{cases} x - y = 2 \\ x + y = 2 \end{cases}$  and approximate any solutions of the system of linear equations.

26. If possible, solve the system below by elimination using substitution.

$$\begin{cases} 2x - 3y = -9 \\ x + y = -2 \end{cases}$$

27. If possible, solve the system below by elimination using addition.

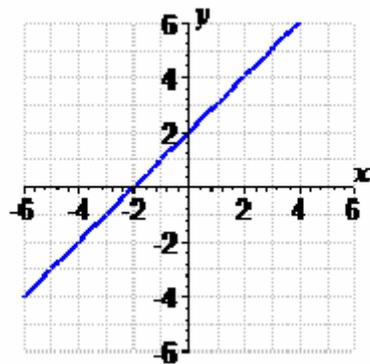
$$\begin{cases} a - 2b = 7 \\ 4a + 2b = 8 \end{cases}$$

28. Identify the system of linear equations as consistent and independent, consistent and dependent, or inconsistent.

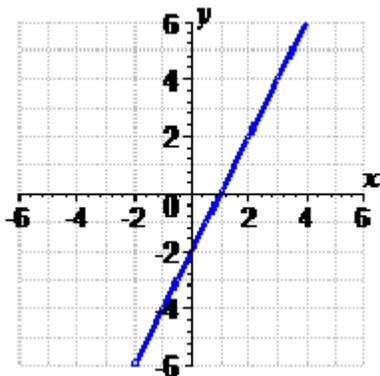
$$\begin{cases} 4x - 4y = 4 \\ 2x - y = 6 \end{cases}$$

29. Given  $f(x) = 3x - 6$  evaluate each of the following:  $f(5)$ ,  $f(-2)$ ,  $f\left(\frac{2}{3}\right)$ ,  $f(0)$ ,  $f(6.2)$

30. Given the graph of  $y = f(x)$  below, evaluate  $f(-6)$ ,  $f(0)$ ,  $f(-2)$ ,  $f(1)$



31. Given the graph of  $y = f(x)$  below, find  $x$  such that  $f(x) = 4$



32. A hot-air balloon at 1020 feet descends at a rate of 85 feet per minute. Let  $y$  represent the height of the balloon and let  $x$  represent the number of minutes the balloon descends. Write an equation that relates the height of the hot-air balloon to the number of minutes it descends.

33. You invest a total of \$5800 in two investments earning 3.5% and 5.5% simple interest. Your goal is to have a total annual interest income of \$283. Write a system of linear equations that represents this situation where  $x$  represents the amount invested in the 3.5% fund and  $y$  represents the amount invested in the 5.5% fund. Solve this system to determine the smallest amount that you can invest at 5.5% in order to meet your objective.