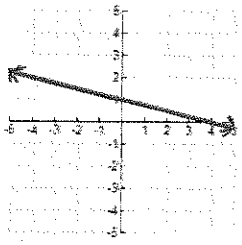
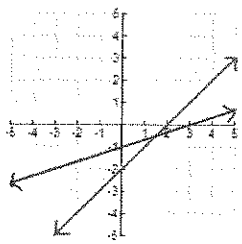
EXERCISES

Determine if each graph shows a system of linear equations that is intersecting, parallel or the same line. State how many solutions there are for each system.

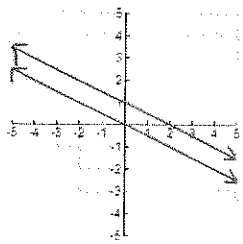
1.



2.



3.



Graph the two linear equations in each system on a single coordinate plane. State whether the lines are intersecting, parallel or the same line.

4. $y = -3x$
$y = \frac{1}{3}x + 3$

5. $y = 3 + \frac{1}{2}x$
$y = \frac{1}{2}x + 3$

6. $y = 1 + 4(x - 1)$
$y = 4(x + 1) + 1$

Determine if the two lines in each system of equations are intersecting, parallel or the same line. State how many solutions there will be for each system. Use words and/or numbers to show how you determined your answer.

7. $y = -3x + 4$
$y = -3x + 3$

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

9. $2y = -4x + 12$
$y = 2x + 4$

10. $y = \frac{1}{3}x - 2$
$-3x + 6y = -12$

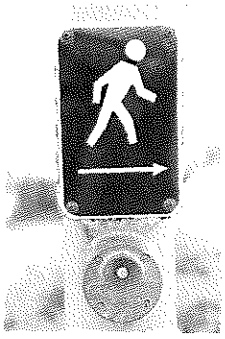
11. $6y = 15$
$10y = 25$

12. $6x + y = 5$
$y = 6x - 3$

13. Two ants crawled across a piece of graph paper. One followed the path of the linear equation $3x + 2y = 8$. The other ant followed the path of the linear equation $2x + 3y = 6$. Will the ants' paths cross? How do you know?

14. A parallelogram was formed by the intersection of the four lines whose equations are given. Determine algebraically which pairs of sides ($\overline{AB}$, $\overline{BC}$, $\overline{CD}$, $\overline{DA}$) are parallel. Verify your answer by graphing.

$\overline{AD}$: $2x + 3y = 6$
$\overline{AB}$: $-6x + 4y = 0$
$\overline{BC}$: $y = -\frac{2}{3}x + 4$
$\overline{CD}$: $y = -5 + \frac{3}{2}x$

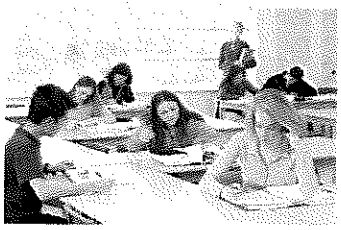


15. Kirk and Samantha walk home from school. The map of their town was placed on a coordinate grid. Kirk walked home following the linear equation $5x + 4y = 28$. Samantha walked home following the path of $y = -\frac{5}{4}x + 7$. Describe the similarities or differences in their paths home.

16. Write a system of two linear equations in which the lines will intersect. Graph the two lines on the same coordinate plane. Use words, graphs and/or numbers to justify your answer.

17. Write a system of two linear equations in which the lines are parallel. Graph the two lines on the same coordinate plane. Use words, graphs and/or numbers to justify your answer.

18. Describe how you can tell if two lines intersect by looking at the linear equations in slope-intercept form.



19. On her Block 4 Test, Victoria was asked to give an example of two lines that are parallel but not the same line. She answered with the equations: $y = 4x + 5$ and $y = 3x + 5$. Did she get the question right? If not, what mistake did she make?

REVIEW

State whether each equation is true or false for the values of the variables given. Show all work necessary to justify your answer.

20. $5x + 2y = 10$ where $x = 0$ and $y = 5$

21. $-3x + y = 7$ where $x = -1$ and $y = -4$

22. $y = \frac{4}{3}x - 2$ where $x = 9$ and $y = 34$

23. $y = 1 + 2(x - 5)$ where $x = 7$ and $y = 5$

Simplify each expression.

24. $4 + 6x - 1 + 2x$

25. $3(x - 2) + 2(x + 7)$

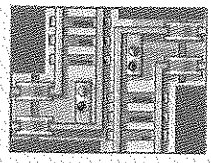
26. $5x + x + 7x - 10x$

27. $6(x - 1) - 2(x + 1)$

28. $7x + 3y - x + 4y - 2x$

29. $3(2x + 4y) + 5(x - 2y)$

Tic-Tac-Toe ~ How Many Solutions?



In this block, all the systems of linear equations only include two equations; however, systems of equations can include more than two equations. A solution to a system of linear equations is the point where all the lines intersect. Each of the systems below has either zero, one or infinitely many solutions. Use input-output tables or graphing to determine the number of solutions. If the system does have one solution, give the point of intersection.

System #1

$y = 3x + 3$
$y = 3x - 4$
$y = 3x - 7$

System #2

$y = 2(x - 3) + 5$
$4x - 2y = 2$
$y = 2x - 1$

System #3

$y = \frac{1}{2}x - 3$
$y = x - 5$
$y = -\frac{3}{4}x + 2$

System #4

$y = \frac{1}{2}x$
$-x + 2y = 6$
$y = \frac{1}{2}(x + 4) - 1$

System #5

$y + x = 6$
$2x + y = 8$
$-x + y = 2$