

Directions: Show all work for full credit. Circle your final answer.

This assignment is due the first day of school.

Use the summer assignment glossary to look up any words in which you need clarification.

Summer Assignment Glossary

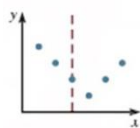
Function

A relation where each input has exactly one output.

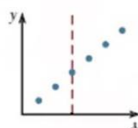
A function should always pass the vertical line test.

A relation represented by a graph is a function provided that no vertical line passes through more than one point on the graph.

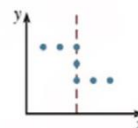
Graphs



Function



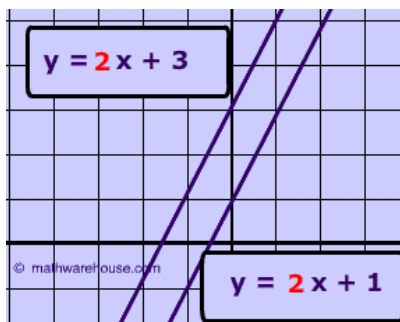
Function



Not a function

Parallel

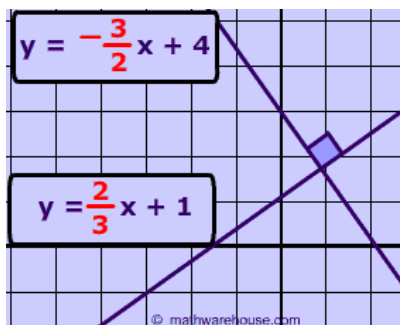
Two lines are parallel if they have the same slope.



Perpendicular

Two lines are perpendicular if they intersect at a 90 degree angle.

Perpendicular slopes are opposite reciprocals of each other.



Polynomial

A monomial or a sum of monomials, each called a term of the polynomial.

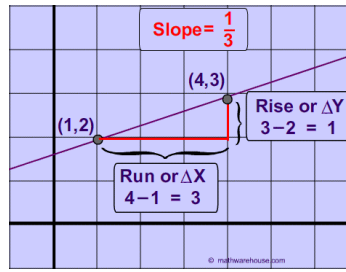
Example: $2x^3 + x^2 - 5x + 12$

Relation

A relation between two sets is a collection of ordered pairs containing one from each set. All functions are relations, but not all relations are functions.

Slope

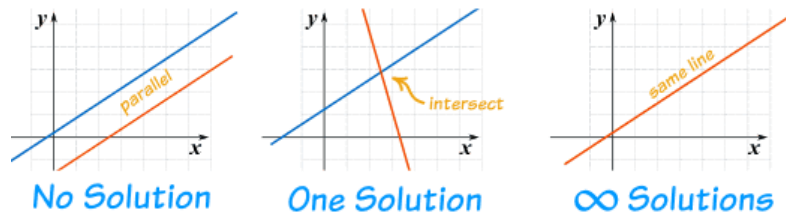
The steepness of a line. The slope is the rate at which y increases compared with x between any two points on a line.



$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{\text{rise}}{\text{run}}$$

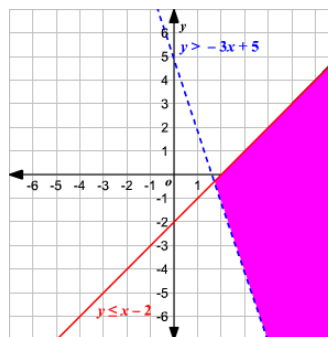
System of Linear Equations

A system of linear equations contains two or more equations working together. The solution occurs where the lines intersect.



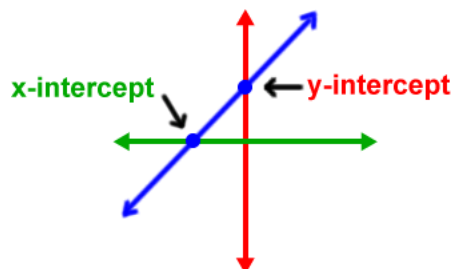
System of Linear Inequalities

A system of linear inequalities contains two or more inequalities working together. The solution is the overlapping shaded region.



y-Intercept

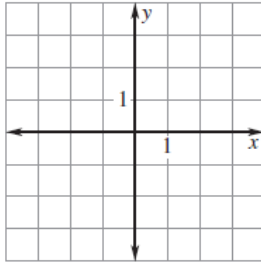
The point where the line or curve on the graph cuts across the y -axis. At the y -intercept, $x = 0$.



Graph the relation. Then tell whether the relation is a function.

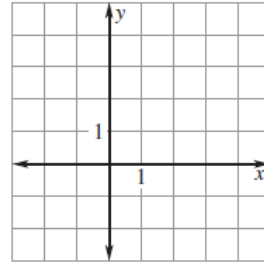
1.

x	-3	-2	-1	0	1
y	3	-3	3	-3	3



2.

x	3	-3	4	0	3	2
y	3	-2	1	1	4	2



Evaluate the function for the given value of x.

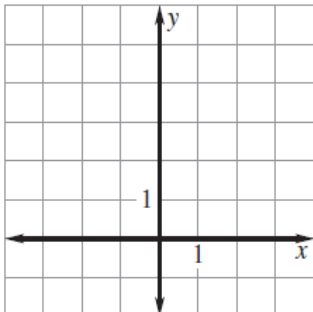
3. $f(x) = |x|$ when $x = -5$

4. $f(x) = 25 - 2x$ when $x = 4$

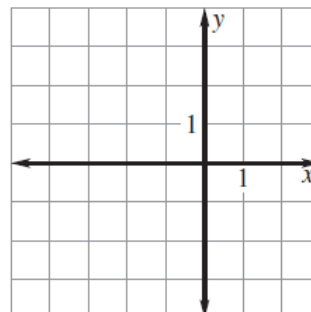
5. $f(x) = x^2 + 5x + 1$ when $x = 1$

Graph the equation.

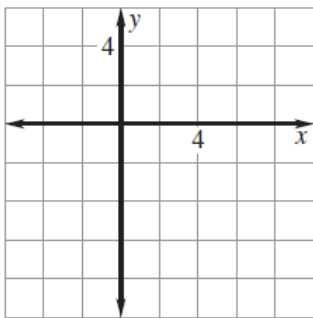
6. $y = 2$



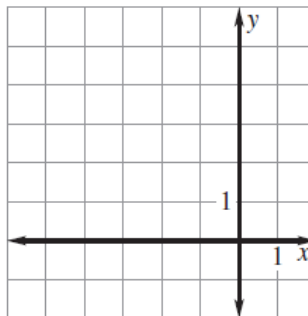
7. $x = -2$



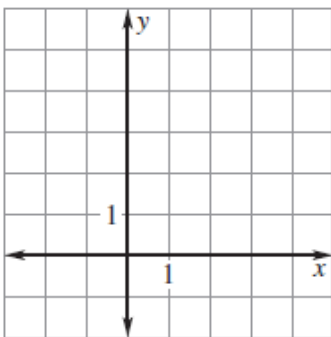
8. $4x - y = 8$



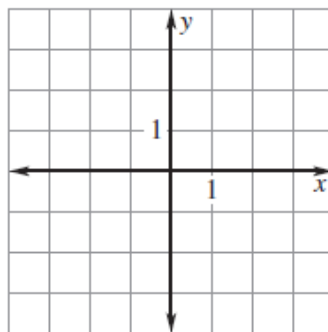
9. $y = \frac{1}{2}x + 3$



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



11. $y = 0$



Write an equation of the line that has the given properties.

12. slope: $\frac{1}{2}$
 y - intercept: 2

13. slope: 1
point: $(2, -3)$

14. *points: (3,4) and (-1,0)*

15. *slope: $-\frac{1}{2}$
point: (-4, -3)*

16. *points: (0,5) and (-5,0)*

17. Write an equation of the line that passes through $(-2, 3)$ and is perpendicular to the line $y = 2x + 1$.

Solve the equation.

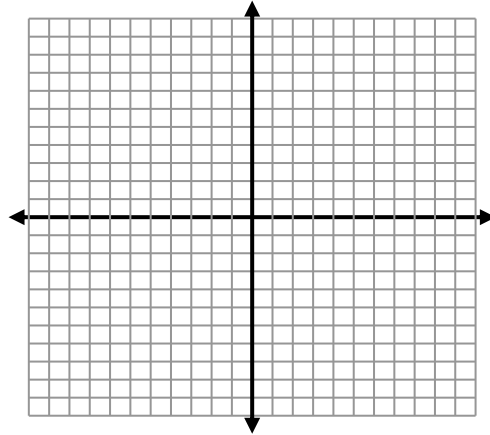
18. $5x - 13 = 12$

19. $3(x + 2) = 8(x - 1) + 5$

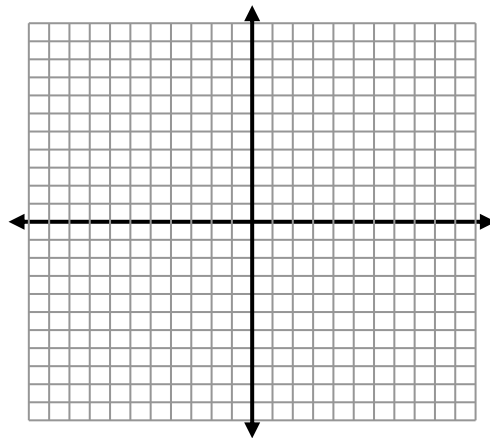
20. $\frac{1}{2}(4x + 8) = -4$

Graph the linear system and tell how many solutions it has. If there is exactly one solution, estimate the solution and check it algebraically.

21. $x + y = 4$
 $x - y = 2$



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



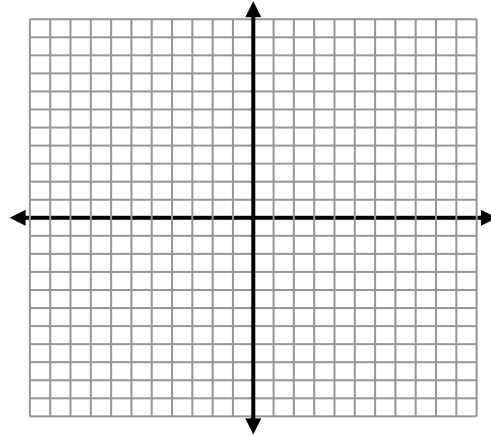
Solve the system using any algebraic method.

23. $x + y = 2$
 $3x - 2y = 6$

24. $5x - 2y = 30$
 $x + 2y = 6$

Graph the system of linear inequalities.

$$\begin{aligned} 25. \quad & y > x + 4 \\ & x \leq 1 \end{aligned}$$



26. Rewrite $(\sqrt[3]{-32})^5$ in rational exponent form.

27. Rewrite $(42)^{4/7}$ in radical form.

Evaluate the expression.

28. $-\sqrt[3]{-27}$

29. $(-16)^{3/4}$

30. $\left(\frac{1}{25}\right)^{3/2}$

31. $64^{-2/3}$

Add or subtract the polynomials.

32. $(2x^3 - 5x^2 + x) + (2x^2 + x^3 - 1)$

33. $(3x^2 + x - 6) + (x^2 + 4x + 10)$

34. $(4x^2 + 5) - (-2x^2 + 2x - 4)$

35. $(4x^2 - 3x + 5) - (3x^2 - x - 8)$

Multiply the polynomials.

36. $x(2x^2 - 3x + 9)$

37. $(x + 2)(x - 3)$

38. $(x - 5)(2x + 3)$

39. $(3x + 2)^2$

Factor the quadratic expressions.

40. $x^2 + 6x + 7$

41. $x^2 - 11x + 10$

42. $x^2 - 7x - 18$

43. $x^2 + 6x - 72$

44. $x^2 + 15x + 44$