

Solve Absolute Value FunctionsSolve for  $x$ .

1.  $|4x - 1| - 3 = 9$

$x = 3.25$

$x = -2.75$

2.  $3|x + 7| + 17 = 5$

no solution

3.  $2|3x - 2| - 10 = -4$

$x = 1.67$

$x = -0.33$

Solve Systems of Equations

Solve each system of equations.

4.  $4x + y = 2$

$x - y = 3$

$(1, -2)$

5.  $4x - y = 20$

$-2x - 2y = 10$

$(3, -8)$

6.  $y = 5x + 4$

$10x - 2y = -8$

many  
solutions

7.  $y = 3|x + 5| - 3$

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

$(-2.69, 3.92)$

$(-8.75, 8.25)$

8.  $y = 2x^2 - 5x - 3$

$8x + 2y = -16$

no  
solution

9.  $y = |x|$

$y - 9 = -(x - 3)^2$

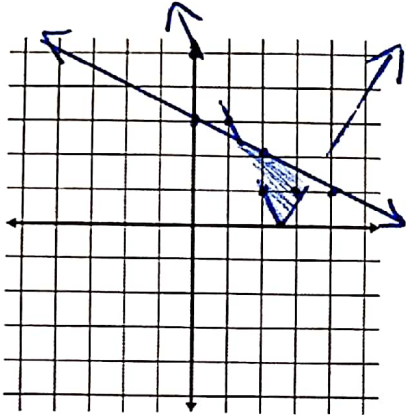
$(0, 0)$

$(5, 5)$

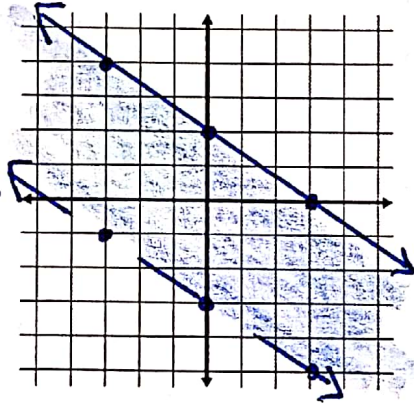
### Solve Systems of Inequalities

Solve each system of inequalities. Pay attention to whether the inequalities would have solid or dotted lines as well as where the shading belongs.

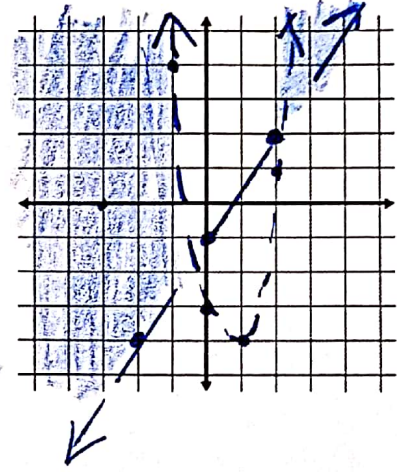
10.  $y \leq -\frac{1}{2}x + 3$   
 $y > |2x - 5|$



11.  $-3y < 2x + 9$   
 $2x + 3y \leq 6$



12.  $y < 3x^2 - 4x - 3$   
 $3x - 2y < 2$



### Applications of Systems

13. An exam worth 145 points contains 50 questions. Some of the questions are worth two points and the rest are worth five points. How many of each type of question is on the test?

35 two point questions

15 five point questions

14. Dennis mowed his next door neighbor's lawn for a handful of dimes and nickels, 80 coins in all. Upon completing the job he counted out the coins and it came to \$6.60. How many of each coin did he earn?

28 nickels

52 dimes

15. A woman owns 21 pets. Each of her pets is either a cat or a bird. If the pets have a total of 76 legs, how many cats and birds does the woman own?

17 cats

4 birds

### Inverses of Functions

Determine the inverse. State if the inverse is a function.

16.  $\{(-5, 6), (0, -1), (7, 4)\}$

$$\{(6, -5), (-1, 0), (4, 7)\}$$

function

17.  $f(x) = \frac{5x+6}{3}$

$$f^{-1}(x) = \frac{3x-6}{5}$$

function

18.  $f(x) = (3x-11)^2$

$$f^{-1}(x) = \frac{\pm\sqrt{x}+11}{3}$$

not a function

### Function Operations

Given  $f(x) = x+2$ ,  $g(x) = 7x-5$ , and  $h(x) = 2x^2+8$ , find the following:

19.  $(f+h)(x)$

$$2x^2+x+10$$

20.  $(g \circ f)(x)$

$$7x^2+9x-10$$

21.  $(g-f)(x)$

$$6x-7$$

22.  $(h \circ g)(x)$

$$14x^3-10x^2+56x-40$$

### Compositions of Functions

Given  $f(x) = 3x+4$ ,  $g(x) = 2x^2-1$ , and  $h(x) = x^3$ , find the following:

23.  $f(g(4))$

$$97$$

24.  $(f \circ h)(x)$

$$3x^3+4$$

25.  $(h \circ g)(x)$

$$(2x^2-1)^3$$

26.  $g(h(x))$

$$2x^6-1$$