

UNIT 6: SOLVING SYSTEMS OF EQUATIONS

Note-Taking Supplement

Student Package

Student's Name: _____

- ☐ Once completed, submit this package to your Learning Facilitator.
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Lesson 1
Graphing Linear Inequalities in Two Variables

1.1 Inequalities**Inequality Symbols**

Reading inequality statements.

Compound inequality statement

Example 1 Describe in words represented by each inequality.

a) $-4 \geq x$

e) $-7 \leq x < -3$

b) $x \leq -4$

f) $18 > y \geq -5$

c) $x > -3$

g) $-1 \leq y \leq 0$

d) $-3 > x$

1.2 Inequalities

Example 2 Write the correct inequality sign that would represent each of the following statements.

Inequality Statements

$<$ $>$ \leq \geq

at most _____ more than _____ less than _____ less than or equal to _____

greater than or equal to _____ no less than _____ at least _____ greater than _____

fewer than _____ no more than _____ a minimum of _____ a maximum of _____

1.3 Inequalities

Solving inequality statements

$$-2x + 5 < -7$$

Operations to an Inequality

Original inequality	Operation	Resulting Inequality	True statement? Answer "yes" or "no"
$4 < 8$	add 4		
$4 < 8$	subtract 4		
$4 < 8$	multiply by 4		
$4 < 8$	divide by 4		
$4 < 8$	multiply by -4		
$4 < 8$	divide by -4		

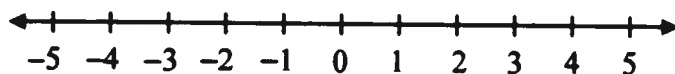
1.4 Inequalities

Solve the inequality $5(4 - x) - 2 \geq 2(1 - x) + 4$

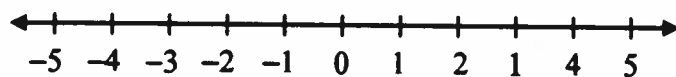
Example 3 Solve the inequality: $\frac{3(x + 1)}{4} + \frac{1}{12} > \frac{5(x - 3)}{6}$

1.5 Graphing Inequalities

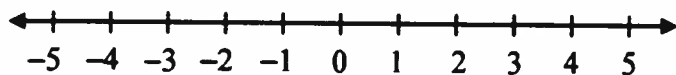
$$x = -3$$



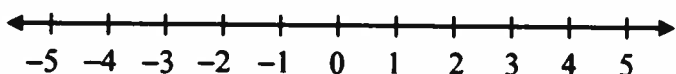
$$x \geq -3$$



$$x > -3$$

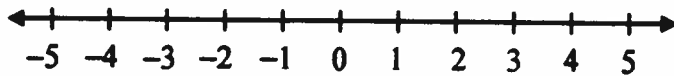


$$-1 \leq x < 4$$

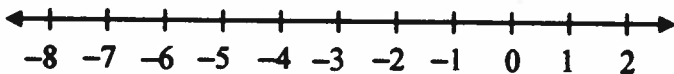


Example 4 Graph the following inequalities on the number line.

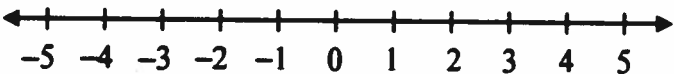
1) $x < 4$



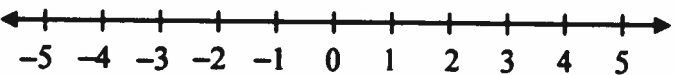
2) $-7 < x \leq 0$



3) $x < -2$ or $x \geq 1$

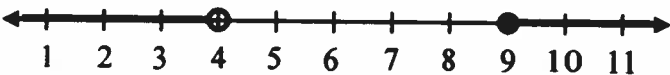
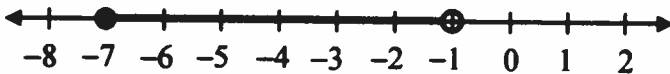
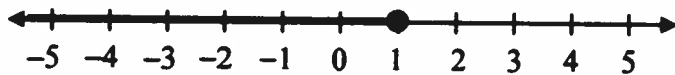


4) $x \neq -1$

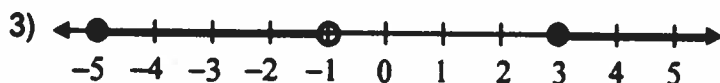
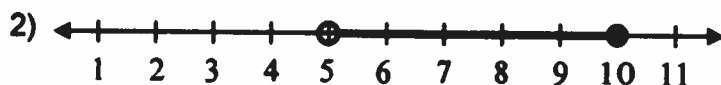
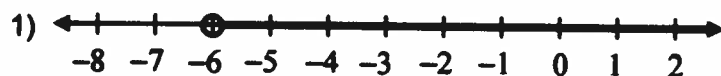


1.6 Graphing Inequalities

Writing inequalities given the graph.



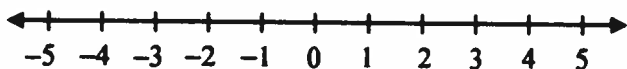
Example 5 Write the algebraic expression that represents the graph on the number line.



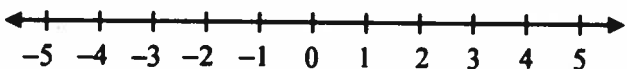
1.7 Graphing Inequalities

Graphing on a number line.

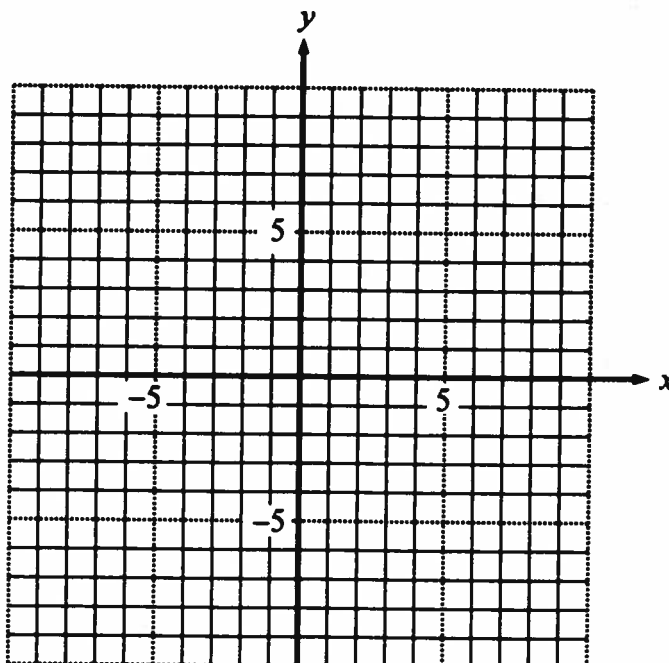
$$x = -3$$



$$x \geq -3$$



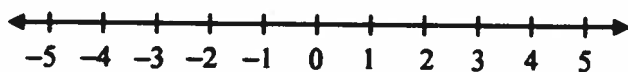
Graphing in a coordinate plane



1.8 Graphing Inequalities

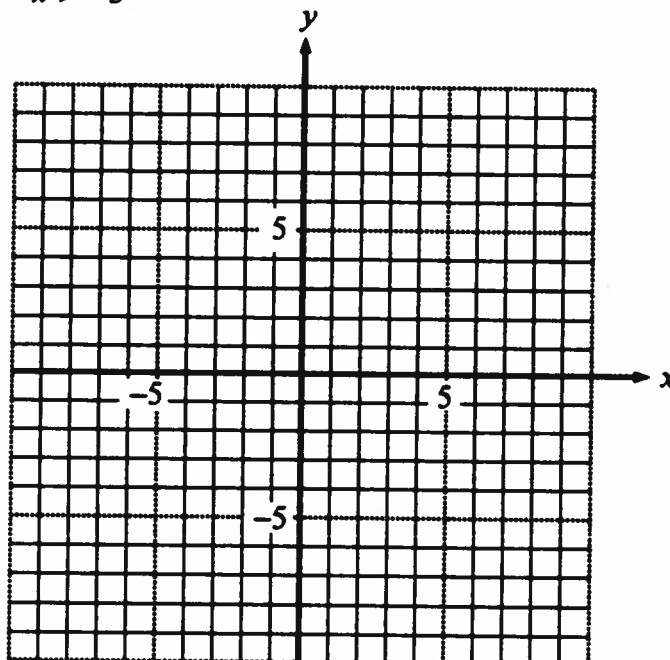
Graphing on a number line.

$$x > -3$$



Graphing in a coordinate plane

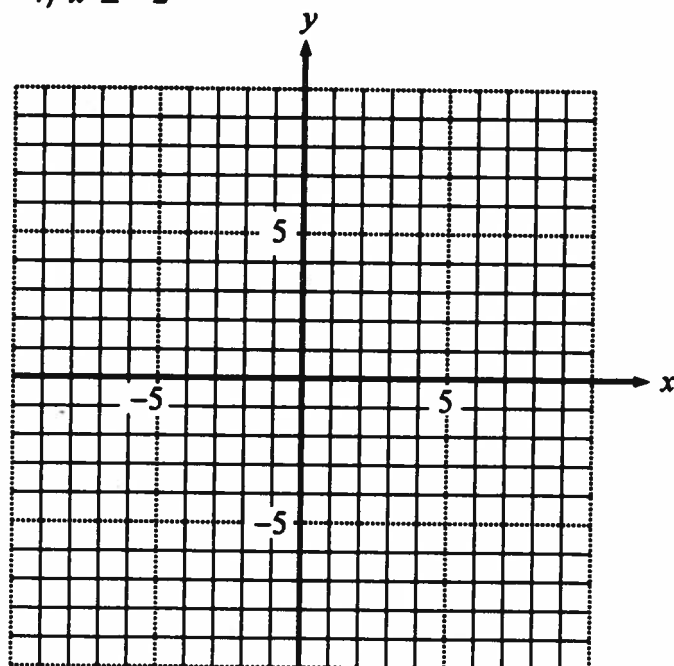
$$x > -3$$



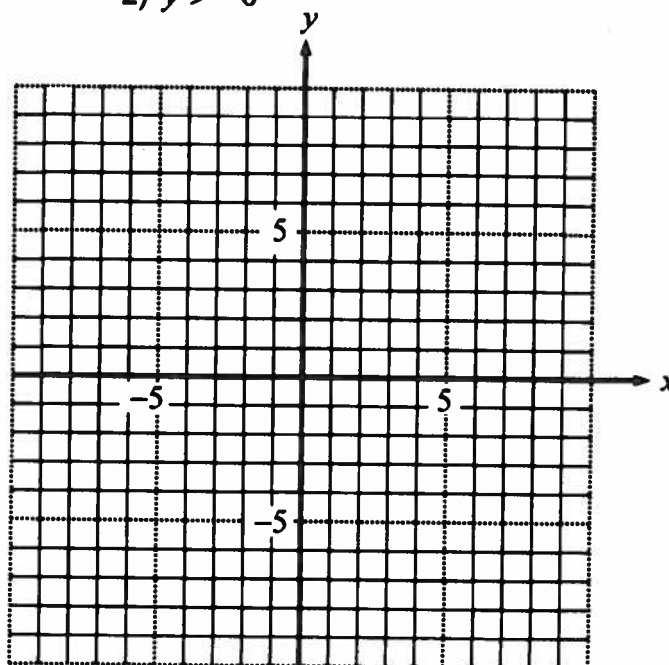
1.9 Graphing Inequalities

Example 6 Graph the following inequalities on the grid provided.

1) $x \leq -2$



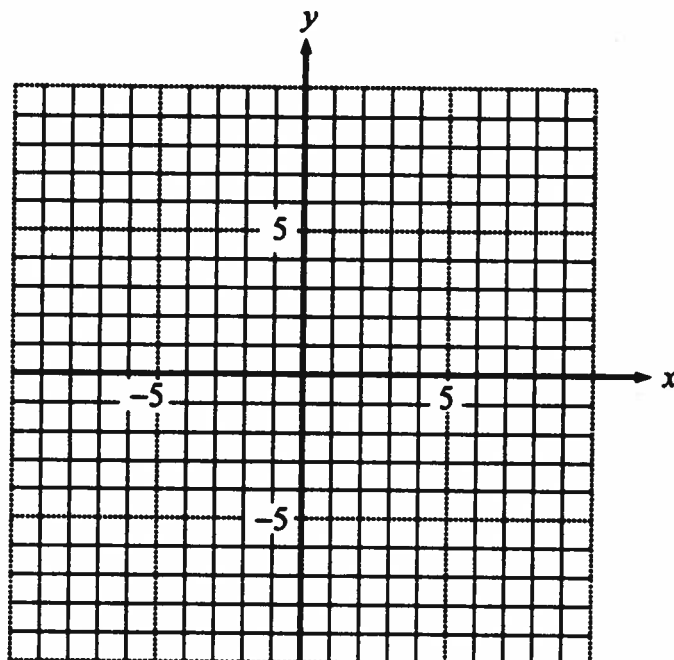
2) $y > -6$



1.10 Graphing Inequalities

Graphing Linear Inequalities in two Variables

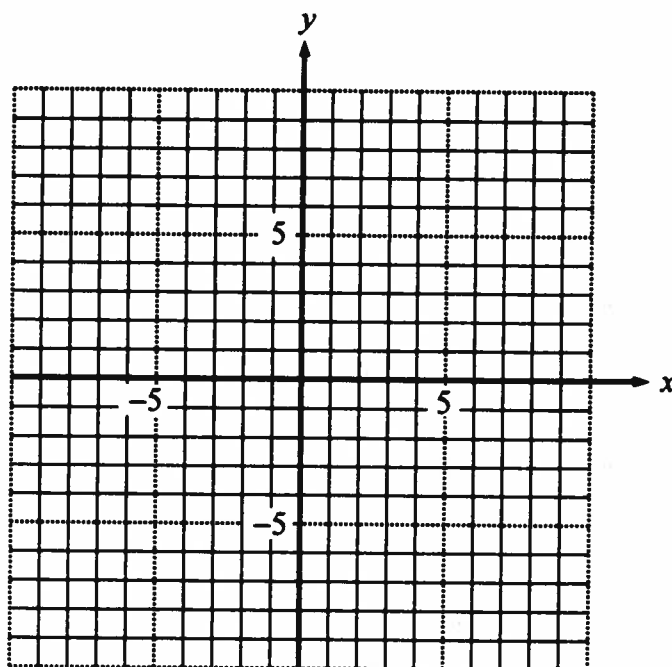
Example 7 Graph $y \leq 3x + 1$



1.11 Graphing Inequalities

Graphing Linear Inequalities in two Variables

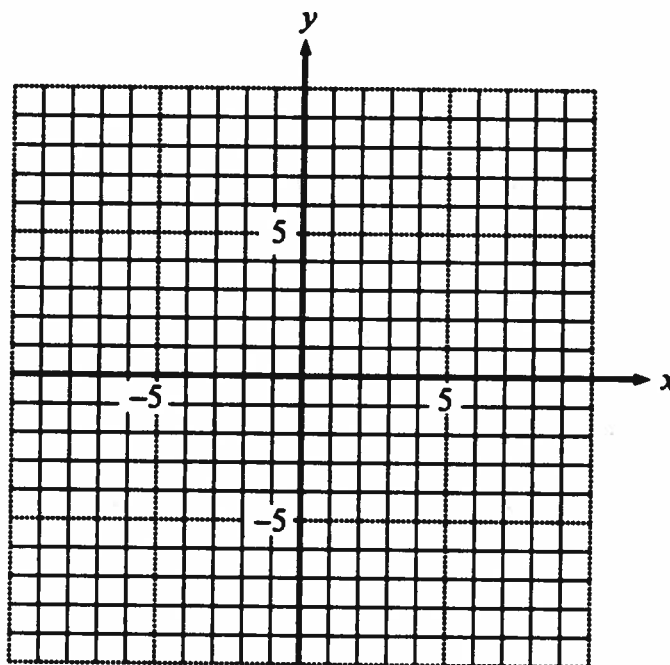
Example 8 Graph $y > -\frac{2}{3}x - 2$



1.12 Graphing Inequalities

Example 9

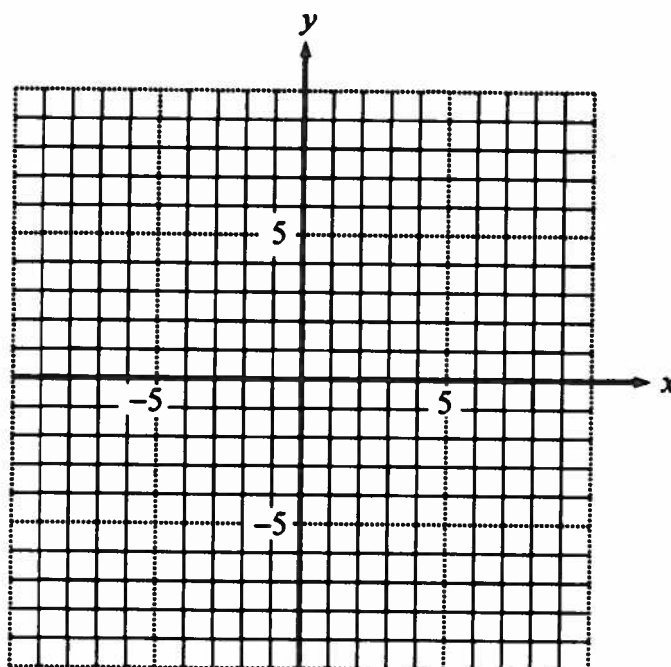
Graph $3x - 4y \geq -12$



1.13 Graphing Inequalities

Example 10

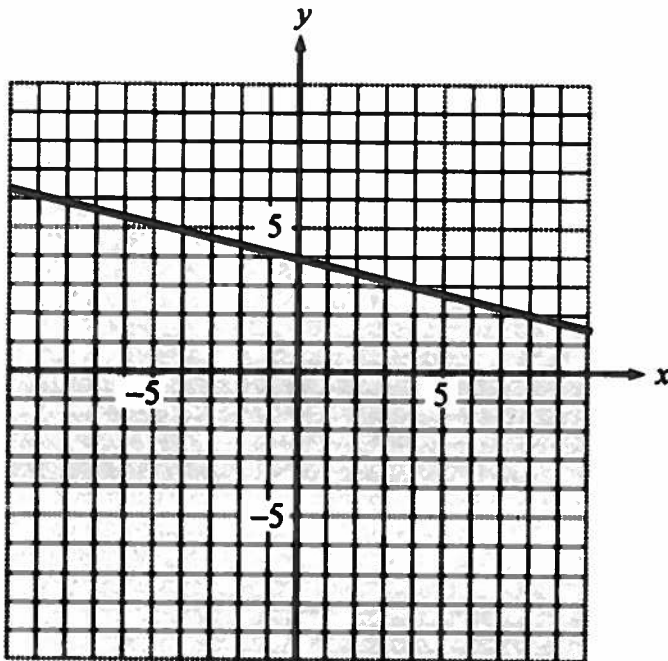
Graph the following inequality on the grid provided: $y > \frac{3}{2}x - 3$ if $x \leq 3$ and $y \geq -2$



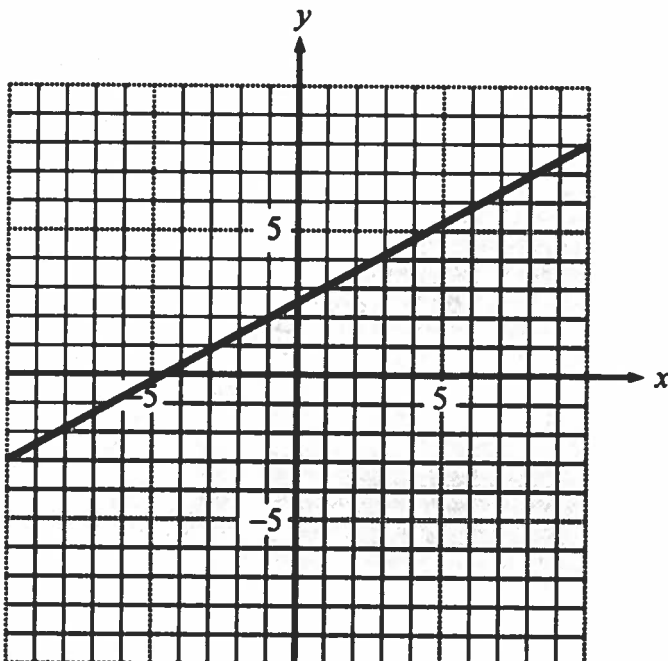
1.14 Writing Inequalities

Write the inequality that represents the shaded region.

Equation of Boundary Line: $y = -4x + 4$

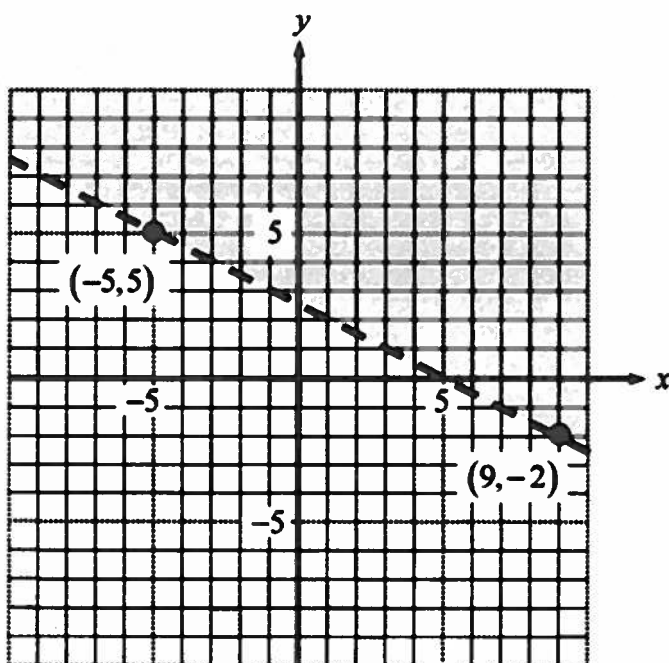


Equation of Boundary Line: $11x - 20y = -50$



1.15 Writing Inequalities

Write an inequality statement that represents the graph.



Lesson 2

Solving Quadratic Inequalities

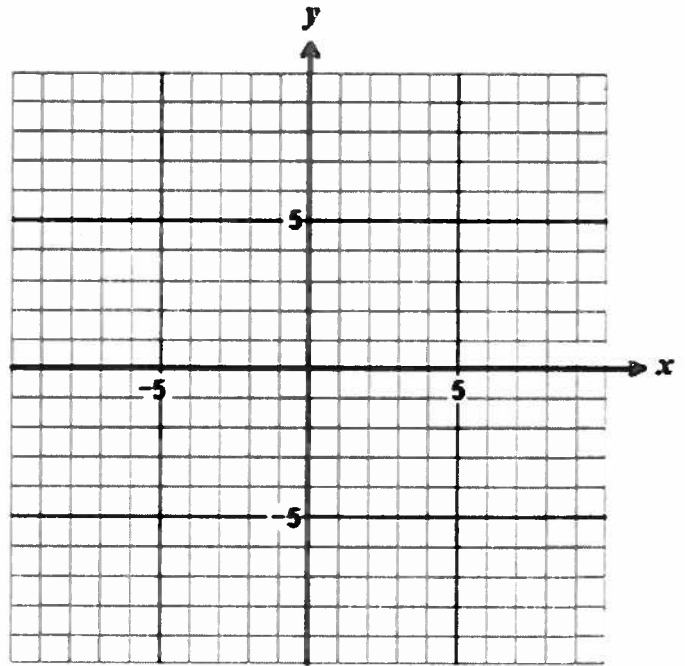
2.1 Solving Quadratic Inequalities in One Variable

A quadratic inequality in one variable can be written in general form using four different inequality signs.

$$ax^2 + bx + c \geq 0$$

Where a , b , and c are constants and a cannot equal zero.

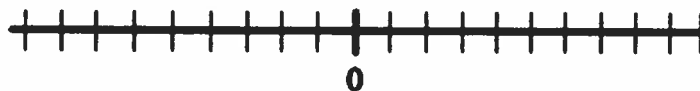
Graph $y = x^2 - 4x - 5$



2.2 Solving Quadratic Inequalities in One Variable

Solve the following quadratic inequality and graph the solution on a number line.

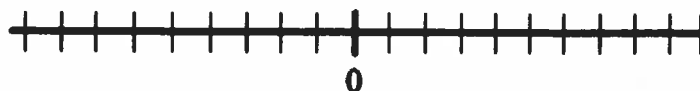
$$x^2 - 4x + 3 \geq 0$$



2.3 Solving Quadratic Inequalities in One Variable

Solve the following quadratic inequality and graph the solution on a number line.

$$3x^2 - 14x - 5 < 0$$



2.4 Solving Quadratic Inequalities in One Variable

Solve the following quadratic inequality and graph the solution on a number line.

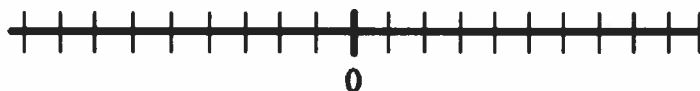
$$4(x - 1)^2 > 12$$



2.5 Solving Quadratic Inequalities in One Variable

Solve the following quadratic inequality and graph the solution on a number line.

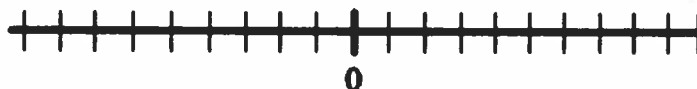
$$2x^2 + 4x \geq 3$$



2.6 Solving Quadratic Inequalities in One Variable

Solve the following quadratic inequality and graph the solution on a number line.

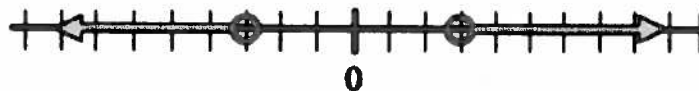
$$\frac{x^2}{2} + \frac{x}{2} \leq 1$$



2.7 Writing Quadratic Inequalities

Write a quadratic inequality statement for the following solution on the number line.

Identify the zeros.



2.8 Writing Quadratic Inequalities

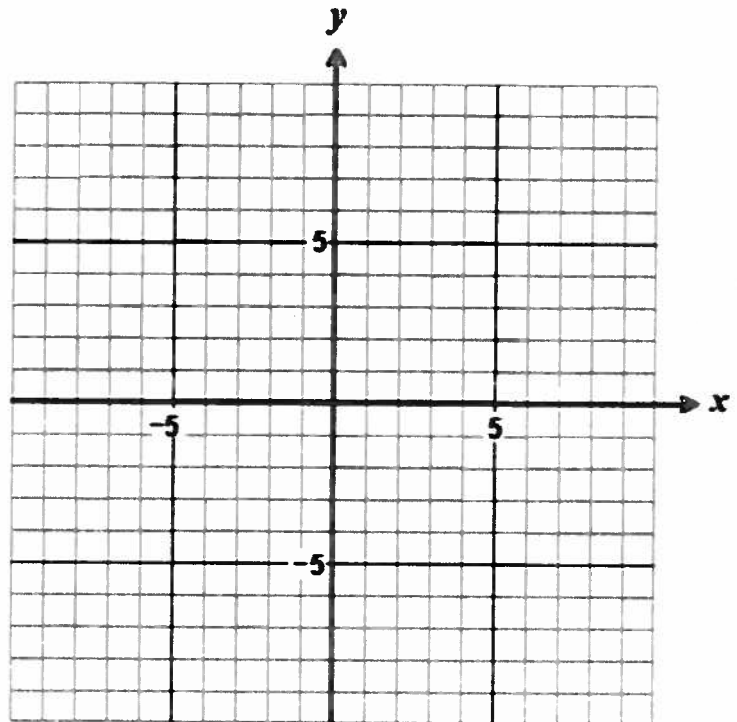
Write a quadratic inequality statement for the following solution on the number line. Press the continue button when you have your answer.



2.9 Solving Quadratic Inequalities in Two Variables

Solve the following quadratic inequality in two variables by graphing.

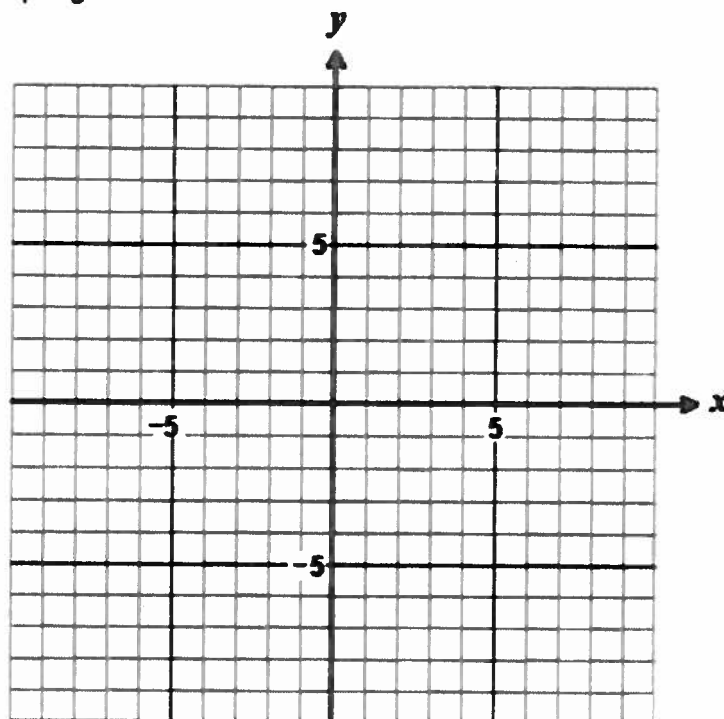
$$y < -2(x - 3)^2 + 1$$



2.10 Solving Quadratic Inequalities in Two Variables

Solve the following quadratic inequality in two variables by graphing.

$$y \leq 3(x - 2)^2 - 4$$



2.11 Solving Quadratic Inequalities in Two Variables

Determine if the point $(2, -3)$ is part of the solution for the following quadratic inequality.

$$y \leq 3(x - 2)^2 - 1$$

Lesson 3
Solving Linear-Quadratic Systems in Two Variables

3.1 Solving Linear Quadratic Systems

Solve the following linear quadratic system of equations

$$y = 5x + 3$$

$$y = 5(x + 1)^2 - 2$$

3.2 Solving Linear Quadratic Systems

Solve the following linear quadratic system of equations

$$y = 3x - 2$$

$$y = 2(x + 4)^2 + 5$$

3.3 Solving Linear Quadratic Systems

Solve the following linear quadratic system of equations

$$y = 5$$

$$y = -5(x - 5)^2 + 5$$

3.4 Solving Linear Quadratic Systems

A rectangular shaped field has a perimeter of 500 yards and an area of 14 400 square yards. Find the length and width.

Write two equations that could be used to solve this problem.

3.5 Solving Linear Quadratic Systems

Example 1 Solve the following linear quadratic system algebraically.

$$y = -2x + 16$$

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

3.6 Solving Linear Quadratic Systems

Example 2 The sum of the squares of two integers is 89. If the smaller integer is two less than twice the larger, find the integers algebraically.

Lesson 4**Solving Quadratic-Quadratic Systems in Two Variables****4.1 Solving Quadratic Quadratic Systems**

Solve the following quadratic quadratic system of equations algebraically.

$$y = -2(x - 3)^2 + 4$$

$$y = 7(x - 3)^2 - 5$$

4.2 Solving Quadratic Quadratic Systems

Example 1 Solve the following quadratic quadratic system of equations algebraically.

$$y = 2(x + 3)^2 - 4$$

$$y = -5(x + 3)^2 + 3$$

4.3 Solving Quadratic Quadratic Systems

Solve the following quadratic quadratic system of equations algebraically.

$$4x^2 + y^2 = 20$$

$$y^2 = 4x + 12$$

4.4 Solving Quadratic Quadratic Systems

Example 2 Solve the following quadratic quadratic system of equations algebraically.

$$y = x^2$$

$$x^2 + y^2 = 20$$

4.5 Solving Quadratic Quadratic Systems

Example 3 Solve the following quadratic quadratic system of equations algebraically.

$$4x^2 + y^2 = 16$$

$$x^2 = y + 4$$

4.6 Solving Quadratic Quadratic Systems Using Technology

Solve the following quadratic quadratic system of equations by graphing technology. Rounded to two decimal places.

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

$$y = 3x^2 + 2x - 1$$

4.7 Solving Quadratic Quadratic Systems Using Technology

Example 4 Solve the following quadratic quadratic system of equations by graphing technology. Rounded to two decimal places.

$$y = 1.7(x - 2)^2 - 2.9$$

$$y = .2(x + 1)^2 + 3.5$$