Lesson 7.1: Solving Systems of Equations Graphically

Explore Your Understanding Assignment

This assignment includes multiple choice and short answer questions. For multiple choice questions, select the best answer. Each is worth 1 mark. Marks assigned to short answer questions are indicated for each question. Be sure to show all necessary work.

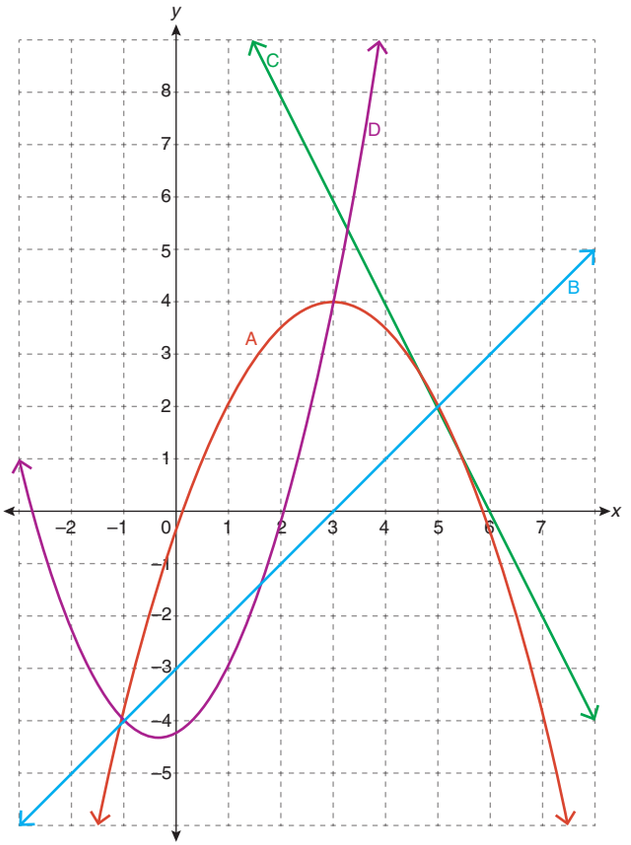
(1)_____ 1. The x-value of a solution to the system $y = -2x^2 + 8$ and $3x - y = -3$ is

A. 6
B. 2.5
C. 1
D. –4.5

(1)_____ 2. The system of equations $y = 16(x - 4)^2 + 9$ and $y = -7(x - 4)^2 + 9$ will have

A. 1 solution
B. 2 solutions
C. no solutions
D. an infinite number of solutions

Use the following diagram to answer question 3.

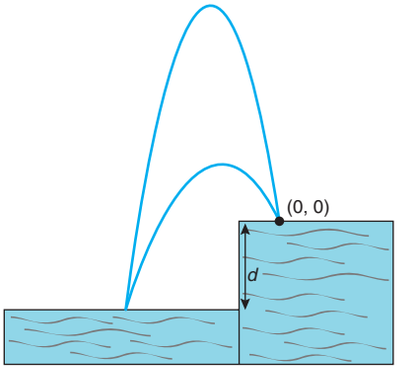


(1) _____ 3. A system of quadratic-linear equations whose only solution is (5, 2) can be formed using lines

A. A and B
B. A and C
C. B and C
D. C and D

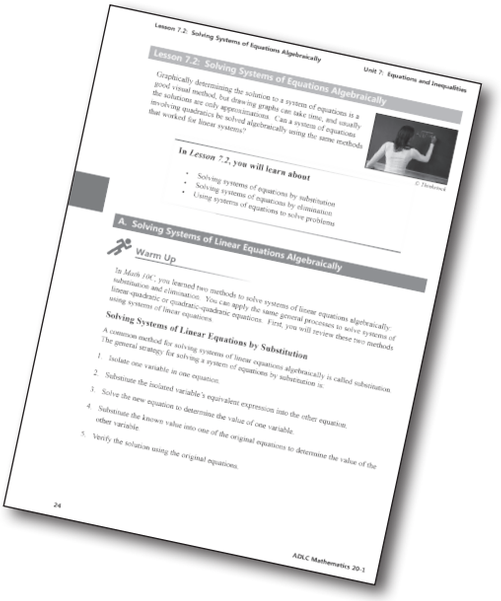
(2) 4. Solve the following system graphically. Verify the solution(s) using substitution.
- $y = 2x^2 + 3x + 1$
- $y = x + 13$

(2) 5. As part of a fountain display, two jets of water travel from the surface of an upper pool and meet at the surface of a lower pool, as shown in the diagram. The paths of the two jets are modelled by $y = -x^2 - 4x$ and $y = -3x^2 - 15x$, where x and y are measured in feet. What is the vertical height difference, d, of the pools? Round the answer to the nearest hundredth.



/7

You have completed *Lesson 7.1 Explore Your Understanding Assignment*. Please return to the *Module* and continue your exploration with *Lesson 7.2*.



Lesson 7.2: Solving Systems of Equations Algebraically

Unit 7: Equations and Inequalities

Lesson 7.2: Solving Systems of Equations Algebraically

Graphically determining the solution to a system of equations is a good visual method, but drawing graphs can take time, and usually the solutions are only approximations. Can a system of equations involving quadratics be solved algebraically using the same methods that worked for linear systems?

In *Lesson 7.2*, you will learn about

- Solving systems of equations by substitution
- Solving systems of equations by elimination
- Using systems of equations to solve problems

A. Solving Systems of Linear Equations Algebraically

Warm Up

In *Math 10C*, you learned two methods to solve systems of linear equations algebraically – substitution and elimination. You can apply the same general processes to solve systems of linear-quadratic or quadratic-quadratic equations. First, you will review these two methods using systems of linear equations.

Solving Systems of Linear Equations by Substitution

A common method for solving systems of linear equations algebraically is called substitution. The general strategy for solving a system of equations by substitution is:

1. Isolate one variable in one equation.
2. Substitute the isolated variable's equivalent expression into the other equation.
3. Solve the new equation to determine the value of one variable.
4. Substitute the known value into one of the original equations to determine the value of the other variable.
5. Verify the solution using the original equations.

24

ADLC Mathematics 20-1