Systems of Linear Equations: Proficiency Exam*

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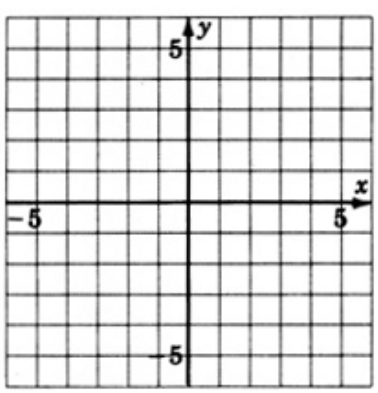
Abstract

This module is from Elementary Algebra by Denny Burzynski and Wade Ellis, Jr. Beginning with the graphical solution of systems, this chapter includes an interpretation of independent, inconsistent, and dependent systems and examples to illustrate the applications for these systems. The substitution method and the addition method of solving a system by elimination are explained, noting when to use each method. The five-step method is again used to illustrate the solutions of value and rate problems (coin and mixture problems), using drawings that correspond to the actual situation. This module contains the proficiency exam for the chapter "Systems of Linear Equations".

1 Proficiency Exam

Exercise 1 ***(Solution on p. 4.)***

(here[1]**)** Solve using graphing: $\begin{cases} 3x+2y=4 \\ 15x+10y=-10 \end{cases}$



*Version 1.4: Jun 1, 2009 12:41 pm -0500
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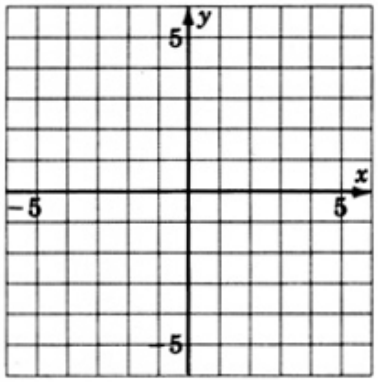
[1]"Systems of Linear Equations: Solutions by Graphing" <http://cnx.org/content/m18881/latest/>

Exercise 2 *(Solution on p. 4.)*

(**here**[2]) Solve using graphing: $\begin{cases} 2x - 3y = 2 \\ x + 2y = 8 \end{cases}$



Exercise 3 *(Solution on p. 4.)*

(**here**[3]) Solve using substitution: $\begin{cases} 2x + 6y = 16 \\ x - 4y = -13 \end{cases}$

Exercise 4 *(Solution on p. 4.)*

(**here**[4]) Solve using addition: $\begin{cases} 3x + 8y = -5 \\ x - 2y = 3 \end{cases}$

Exercise 5 *(Solution on p. 4.)*

(**here**[5], **here**[6]) Solve using either substitution or addition: $\begin{cases} 4x - 4y = 8 \\ x - y = 5 \end{cases}$

Exercise 6 *(Solution on p. 4.)*

(**here**[7], **here**[8]) Solve using either substitution or addition: $\begin{cases} 9x + 3y = 12 \\ 3x - y = 4 \end{cases}$

Exercise 7 *(Solution on p. 4.)*

(**here**[9]) The sum of two numbers is 43 and the difference of the same two numbers is 7. What are the numbers?

Exercise 8 *(Solution on p. 4.)*

(**here**[10]) A chemist needs 80 ml of an 18% acid solution. She has two acid solutions, A and B, to mix together to form the 80-ml solution. Acid solution A is 15% acid and acid solution B is 20% acid. How much of each solution should be used?

[2] "Systems of Linear Equations: Solutions by Graphing" <http://cnx.org/content/m18881/latest/>
[3] "Systems of Linear Equations: Elimination by Substitution" <http://cnx.org/content/m21984/latest/>
[4] "Systems of Linear Equations: Elimination by Addition" <http://cnx.org/content/m21986/latest/>
[5] "Systems of Linear Equations: Elimination by Substitution" <http://cnx.org/content/m21984/latest/>
[6] "Systems of Linear Equations: Elimination by Addition" <http://cnx.org/content/m21986/latest/>
[7] "Systems of Linear Equations: Elimination by Substitution" <http://cnx.org/content/m21984/latest/>
[8] "Systems of Linear Equations: Elimination by Addition" <http://cnx.org/content/m21986/latest/>
[9] "Systems of Linear Equations: Applications" <http://cnx.org/content/m21983/latest/>
[10] "Systems of Linear Equations: Applications" <http://cnx.org/content/m21983/latest/>

Exercise 9 *(Solution on p. 4.)*

(here[11]) A parking meter contains 32 coins. If the meter contains only nickels and quarters, and the total value of the coins is $4.60, how many of each type of coin are there?

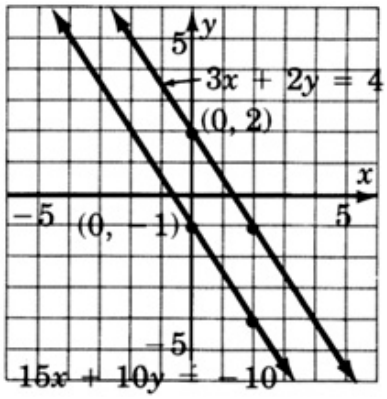
Exercise 10 *(Solution on p. 4.)*

(here[12]) A person has $15,000 to invest. If he invests part at 8% and the rest at 12%, how much should he invest at each rate to produce the same return as if he had invested it all at 9%?

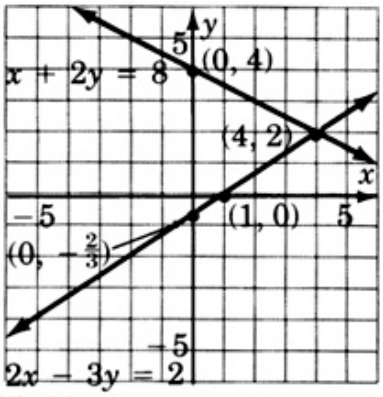
[11] "Systems of Linear Equations: Applications" <http://cnx.org/content/m21983/latest/>
[12] "Systems of Linear Equations: Applications" <http://cnx.org/content/m21983/latest/>

Solutions to Exercises in this Module

Solution to Exercise (p. 1)
inconsistent



Solution to Exercise (p. 2)
$(4, 2)$



Solution to Exercise (p. 2)
$(-1, 3)$
Solution to Exercise (p. 2)
$(1, -1)$
Solution to Exercise (p. 2)
inconsistent
Solution to Exercise (p. 2)
$\left(\frac{4}{3}, 0\right)$
Solution to Exercise (p. 2)
18 and 25
Solution to Exercise (p. 2)
32 ml of solution A; 48 ml of solution B.
Solution to Exercise (p. 3)
17 nickels and 15 quarters
Solution to Exercise (p. 3)
$11,250 at 8%; $3,750 at 12%