Course: MFM2P Gr. 10 Applied   **Lesson: 32**

Unit: Linear Systems   **Topic: Unit Review**

■ *homework check:* <u>**FM10**</u> **p. 216 # 3, 4, 6 – 9**

■ *note:* <u>**Unit Review**</u>

<u>**FM10**</u> **p. 226 # 2, 4, 6, 7, 8, 11, 12, 13**
<u>**FM10**</u> **p. 228 # 1 – 3 a, 4, 5, 6, 8**

Review of Key Terms

1. Explain the meaning of each term in your own words.

a) linear system

b) point of intersection

c) substitution method

d) elimination method

5.1 Solve Linear Systems by Graphing, pages 198 to 204

2. Solve each linear system by graphing.

a) $y = 2x + 3$
$y = x + 4$

b) $2x - y = -13$
$x - y = -10$

c) $x + y = 7$
$3x - y = 5$

d) $2x - y = 2$
$4x + y = 10$

3. Use a graphing calculator to solve each linear system. Round answers to two decimal places where necessary.

a) $y = -3x + 4$
$y = 4x + 13$

b) $y = 5x - 6$
$y = \dfrac{2}{5}x - \dfrac{3}{5}$

c) $y = -4x + \dfrac{2}{3}$
$y = 2x + \dfrac{8}{3}$

d) $y = 6x - 13$
$y = -\dfrac{3}{4}x - \dfrac{5}{2}$

5.2 Solve Linear Systems by Substitution, pages 205 to 211

4. Solve each linear system by substitution.

a) $y = 7x + 1$
$2x + y = 10$

b) $2x + y = 4$
$4x - y = -1$

c) $x - y = 7$
$3x + y = 5$

d) $x + y = 5$
$x - y = -1$

5. On his farm, Maddock plants a total of 20 ha. He plants both corn and canola. If he plants three times as much corn as canola, how many hectares of each type of plant does he plant?

6. A teacher plans to buy books for her class. She has 28 students and wants to buy a book for each one of them. The books cost $5 each for softcovers and $8 each for hardcovers. The teacher has $173 to spend. How many of each type of book can she buy?

5.3 Solve Linear Systems by Elimination, pages 212 to 218

7. Solve each linear system by elimination.

a) $x + 2y = 3$
$x - 4y = 0$

b) $3x + 2y = 18$
$x - 3y = -5$

c) $2x - 3y = -19$
$4x + 6y = 28$

d) $3x + y = 4$
$6x - y = -1$

8. Isabella rode her motorcycle at constant speed. It took her 2 hours to travel 216 km with the wind behind her. The return trip took her 3 hours riding into the wind.

a) Let s represent the speed of the motorcycle and w represent the speed of the wind. Write a linear system to represent this situation.

b) Find the speed of the motorcycle and the speed of the wind.

9. The Athletic Council wants to buy a total of 45 volleyballs and basketballs. The council has $435 to spend. Each volleyball costs $8 and each basketball costs $11. How many of each type of ball can be purchased?

5.4 Solve Problems Involving Linear Systems, pages 219 to 225

10. Solve each linear system. Which method did you use each time? Why?

a) $x + 3y = 7$
$2x + 4y = 11$

b) $2x - y = 27$
$x + y = 12$

c) $y = -x + 8$
$y = 6x + 1$

d) $y = 2x - 8$
$x - y = 4$

11. Anna has a total of $6000 to invest. She puts part of it in an investment paying 8% per year, and the rest in an investment paying 6% per year. At the end of one year, Anna earned $440 in interest. How much did she invest at each rate?

12. Doug is buying a new cell phone. He has narrowed his choices down to two plans. The first plan costs $40 per month with unlimited calling. The second plan costs $10 per month plus $0.10 per minute. Which plan should Doug choose? Explain your choice.

13. Carlie has a jar of coins. She tells her sister that the jar has 45 quarters and dimes altogether and the value of the coins is $6.30. Find the number of each type of coin in the jar.

1. Solve by graphing.

  a) $y = 2x + 3$

  $y = x + 4$

  b) $y = 3x - 4$

  $y = \frac{1}{2}x + 1$

  c) $y = -5x + 2$

  $y = x + 8$

2. Solve by substitution.

  a) $2x - y = 3$

  $x - y = 4$

  b) $x = 4y - 3$

  $2x + y = 6$

  c) $x - 2y = 7$

  $2x = 3y + 13$

3. Solve by elimination.

  a) $2x - y = -13$

  $x - y = -10$

  b) $2x - y = -2$

  $x + 2y = 9$

  c) $4x - 3y = 11$

  $2x + 3y = -1$

4. Solve the linear system. Which method did you use? Why?

  $4x + 5y = 3$

  $2x - 3y = 7$

5. a) Explain how you would solve this linear system.

  $y = 7x + 1$

  $2x + y = 10$

  b) What is the solution?

6. Nathan and Vivek have part-time jobs at the same company. Nathan is paid $10 per shift and $4 for each item he makes in his shift. Vivek is paid $40 per shift and $1 per item he makes.

  a) Write a system of linear equations to represent this situation.

  b) How many items must each person make in one shift to earn the same amount of money?

  c) How much will they each earn for that shift?

7. Ramona is planning to have graduation shirts made. Company A charges a $40 set-up fee plus $5 per shirt for printing. Company B charges a $100 set-up fee plus $2 per shirt for printing.

  a) Write a system of linear equations to represent this situation.

  b) Find the number of shirts for which the cost is the same for both companies.

  c) Under what circumstances should Ramona choose company A? Company B? Explain.

Chapter Problem Wrap-Up

To wrap-up his fundraising campaign, Logan organized a dog show. The cost to rent the park was $1300 plus $2.50 per person for the snack bar fee. Logan charged $5 for each student ticket and $8 for each adult ticket. His total ticket sales were $3585 and the total attendance was 525 people.

a) How many students attended the dog show?

b) How many adults attended the dog show?

c) How much money did Logan raise with this event for the dog rescue organization?

8. Snowbound Adventures charges a $5 flat fee plus $1/h to rent snowboarding equipment. Shred-Zone charges a $7 flat fee plus $0.50/h to rent snowboarding equipment.

a) Write a linear equation to represent the total cost for each company.

b) What is the point of intersection of the linear system? What do the coordinates of the point of intersection mean in terms of this situation?

c) Describe a situation in which it was cheaper to rent equipment from Snowbound Adventures.

9. The school sold 108 tickets for the spring concert. Student tickets cost $2 each and adult tickets cost $5 each.

a) The concert proceeds were $351. How many students attended?

b) If each of the 108 concert attendees paid an average of $3 for refreshments, find the total revenue from the concert.

10. Barbara and her daughter Linda are choosing a new cell phone plan. CellularPlus charges $10 per month and $0.35 per minute for any minutes used during the month. CheapCell charges $20 per month and $0.15 per minute for every minute used in the month. For what number of minutes per month will the plans cost the same amount?