LINEAR SYSTEMS

Instructions:  - Show all your work  
- Use a pencil  
- Calculators are permitted

PART A

1. This graph represents the cost to produce pizza. Graph B represents the daily cost to produce pizza. Graph B represents the daily income from the sale of pizzas.

   a) Describe what the point of intersection represents.

   b) How many pizzas must be sold before there is a profit (that is, the income is greater than the cost)? Explain.

2. Solve this linear system by graphing. Check your solution.

   y = 2x + 5
   y = 4x + 3

   Solution: ( , )

   Check:
3. Solve each linear system by substitution. Write your steps. Check your solutions.
   a) \( y = 3x + 2 \)  
   b) \( x + y = 4 \)  
   c) \( 5x - 3y = 47 \)  
   y = 6x - 1  
   x - y = 5  
   6x - y = 7  

4. Solve each linear system by elimination. Show your steps. Check your solutions.
   a) \( x + y = 5 \)  
   b) \( 3x + 2y = 18 \)  
   c) \( 2x + 5y = 2 \)  
   x - y = 3  
   x + y = 1  
   3x - 2y = -16
5. Eight thousand people attended a rock concert. The ticket prices were $50 and $30. The total revenue from the ticket sales was $250 000. How many tickets of each price were sold?

6. A golf club charges its members an annual fee, and a greens fee for each golf game played. In one year, Ron played 12 games and paid $814. In the same year, Jane played 29 games and paid $1188.
   a) What is the annual fee?
   b) What is the greens fee?
PART B – Graphing Calculator

1. Solve each linear system using a graphing calculator. Round to two decimal places.
   a) \( y = 0.3x + 1 \)
   b) \(-2.4x + y + 5 = 0 \)  
       \( y = -1.2x - 3 \)
       \(-0.45x + y - 1 = 0 \)
   Solution: \( ( , ) \)  
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2. A company produces compact discs. Each disc sells for $8. The income, \( C \) dollars, from the sale of \( x \) discs is given by \( C = 8x \). The cost to produce \( x \) discs is given by \( C = 4x + 48 \, 000 \). Use the following WINDOW settings: \( X_{\text{min}} = 0, \ X_{\text{max}} = 16 \, 000, \ X_{\text{scl}} = 1 \, 000, \ Y_{\text{min}} = 0, \ Y_{\text{max}} = 150 \, 000, \ Y_{\text{scl}} = 10 \, 000, \ X_{\text{res}} = 1 \)
   a) Solve this linear system:
      \( C = 8x \)
      \( C = 4x + 48 \, 000 \)
   Solution ( , , )

   b) What does the point of intersection represent?

   c) How many discs must be sold before there is a profit (that is, the income is greater than the cost)?

3. Amherstburg and Somewhereville are two towns in Ontario. They are 350 km apart. Car A travels from Somewhereville to Amherstburg at an average speed of 70 km/h. Its journey is described by the equation \( d = 350 - 70t \). Car B travels from Amherstburg to Somewhereville at an average speed of 80 km/h. Its journey is described by the equation \( d = 80t \).
   For each car, \( d \) kilometers represents its distance from Amherstburg after driving for \( t \) hours.
   a) Solve the linear system formed by the two equations.

   WINDOW: \( X_{\text{min}} = \)
   \( X_{\text{max}} = \)
   \( X_{\text{scl}} = \)
   \( Y_{\text{min}} = \)
   \( Y_{\text{max}} = \)
   \( Y_{\text{scl}} = \)
   \( X_{\text{res}} = 1 \)
   Solution:

   b) What does the point of intersection represent?