



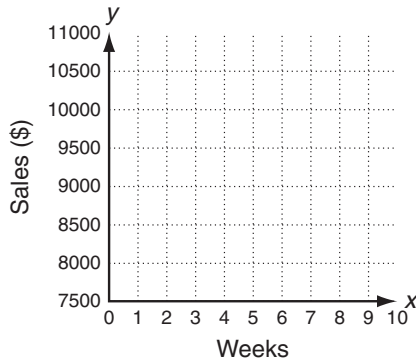
## Problem Solving

### Multiple Representations of Functions

Yvonne opened a new video game store. The table shows a record of her sales for the first five weeks. To break even, she needs to sell at least \$12,500 worth of merchandise each week. She assumes the sales trend will continue and wants to know what to expect over the next weeks.

Weekly Store Sales	
Week	Sales (\$)
1	8470
2	8920
3	9360
4	9790
5	10,210

- Graph the data using weeks as the independent variable and sales as the dependent variable.



- Yvonne thinks she can model her sales data using a quadratic function. Is she correct? How do you know?

- Use a graphing calculator to perform the appropriate regression on the data. Write the equation that models the data.

- What sales can Yvonne expect in week 6?
- When will her sales exceed \$11,000 per week?
- When will she break even?
- When will sales be twice the sales of week 1?

Choose the letter for the best answer.

- Which equation represents a steady increase of \$420 per week in sales from week 5 on?
  - A  $y = -420x + 10,210$
  - B  $y = 420x + 10,210$
  - C  $y = -5x^2 + 420x + 10,210$
  - D  $y = -420x^2 + 10,210x$

- During which week will Yvonne break even if the sales pattern changes and sales in week 6 and week 7 are \$10,640 and \$11,080, respectively?
  - F Week 9
  - G Week 10
  - H Week 11
  - J Week 12



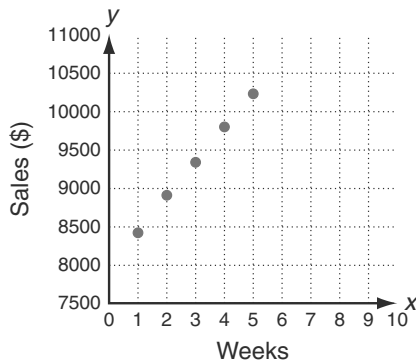
# Problem Solving

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- Graph the data using weeks as the independent variable and sales as the dependent variable.



- Yvonne thinks she can model her sales data using a quadratic function. Is she correct? How do you know?

**Yes, because second differences are constant. For a quadratic function, second differences are constant.**

- Use a graphing calculator to perform the appropriate regression on the data. Write the equation that models the data.

$$y = -5x^2 + 465x + 8010$$

- What sales can Yvonne expect in week 6?
- When will her sales exceed \$11,000 per week?
- When will she break even?
- When will sales be twice the sales of week 1?

**\$10,620**

**Week 7**

**Week 11**

**Week 28**

Choose the letter for the best answer.

- Which equation represents a steady increase of \$420 per week in sales from week 5 on?

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