

# Questions...

8. A refinery produces oil and gas.
- At least 2 L of gasoline is produced for each litre of heating oil.
  - The refinery can produce up to 9 million litres of heating oil and 6 million litres of gasoline each day.
  - Gasoline is projected to sell for \$1.10 per litre. Heating oil is projected to sell for \$1.75 per litre.

The company needs to determine the daily combination of gas and heating oil that must be produced to maximize revenue. Create a model to determine this combination (10, 0). What would the revenue be?

## Optimization Model

Let  $g$  represent the number of litres of gasoline.  
 Let  $h$  represent the number of litres of heating oil.  
 Let  $R$  represent the total revenue from sales.

Restrictions:  
 $g \in \mathbb{R}, h \in \mathbb{R}$

Constraints:

$g \geq 0$   
 $h \geq 0$

Quad 1

$g \geq 2h$   
 $g \leq 6\,000\,000$   
 $h \leq 9\,000\,000$

Objective function to maximize:  
 $R = 1.10g + 1.75h$

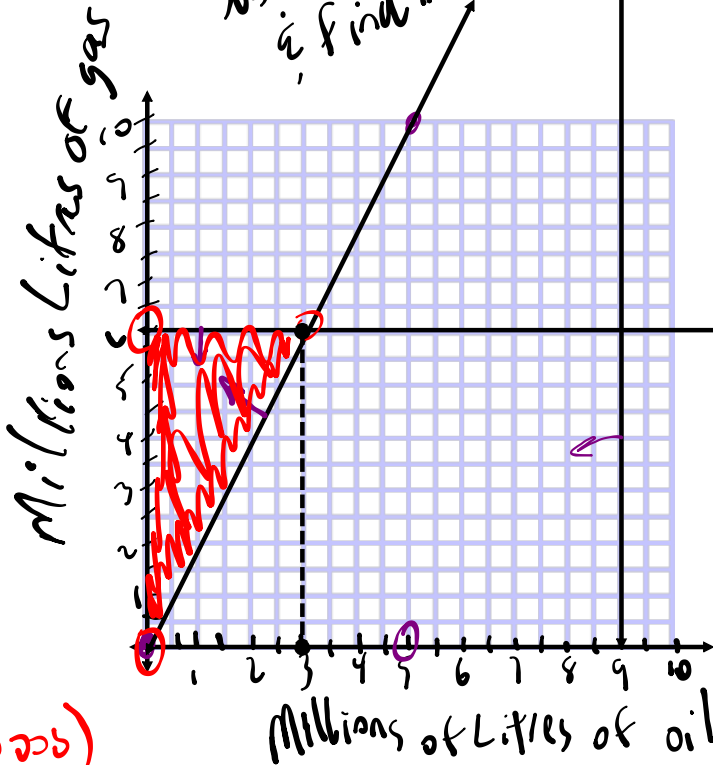
gas depends on oil  
 $x \rightarrow$  millions litres of oil  
 $y \rightarrow$  millions litres of gas  
 $x \in \mathbb{R} \quad y \in \mathbb{R}$

$y = 2x$   
 $y = 2x$   
 $CS \geq RS$   
 $0 \mid 2(10)$   
 $20$   
 $20$

x	y
0	0
10	20
5	10

vertex  
 $(0,0)$   
 $(0,6)$   
 $(3,6)$  Max

$R = 1.75x + 1.10y$   
 $y \geq 2x$   
 $x \leq 9$   
 $y \leq 6$   
 GRAPH



$R = 1.75(3\,000\,000) + 1.10(6\,000\,000)$

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= 1.75(3000000)+1.1(6000000)
11850000
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# HOMEWORK: Test is on TUESDAY!!!

\*\*\* CHECK AND CORRECT your quiz...on the website!!!

## Review/Practice Questions...

- p. 239: Mid-Chapter Review (Frequently Asked Questions)
- p. 241: Mid-Chapter Practice Questions
- p. 266: Chapter Review (Frequently Asked Questions)
- p. 267: Chapter Practice Questions
- p. 265: Chapter Self-Test (Do this AFTER you practice)

1)  
2)  
3)

READ