

Questions... p. 259 # 5, 7, 8, 11, 13

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. 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:  
 $g \geq 0$   
 $h \geq 0$   
 $g \geq 2h$   
 $g \leq 6\,000\,000$   
 $h \leq 9\,000\,000$

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

gas depends on oil  
 $x$

$y$   
 $x \rightarrow$  # of L of oil (millions)  
 $y \rightarrow$  # of L of gas (millions)

$x \in \mathbb{R} \quad y \in \mathbb{R}$   
Quad I Graphed

Objective  $R = 1.75x + 1.10y$

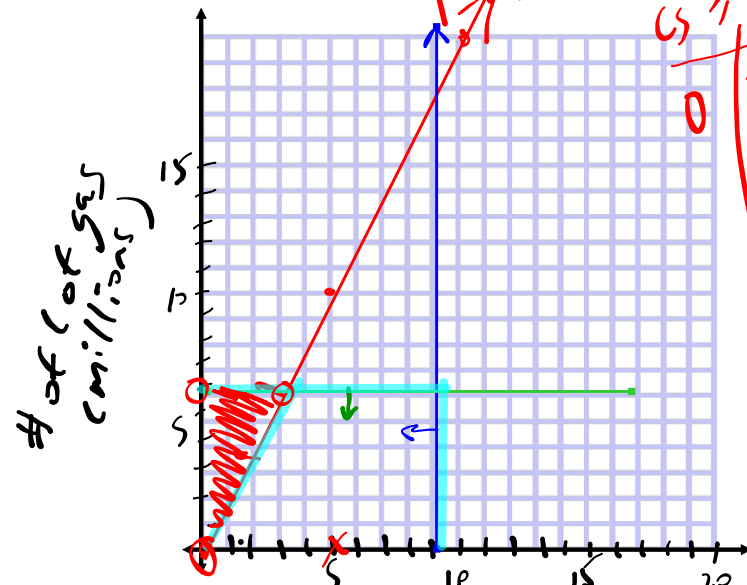
$y \geq 2x$   
 $x \leq 9 \quad y \leq 6$

sub vertices and find the min/max

Test (5,0)  
 $y \geq 2x$   
 $5 \geq 2(5)$   
 $5 \geq 10$   
no

$y = 2x$

x	y
0	0
5	10
10	20



vertex	$R = 1.75x + 1.10y$
(0,0)	
(0,6)	
(3,6)	Max

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

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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 #4 →
- p. 265: Chapter Self-Test (Do this AFTER you practice)

1)  
2)  
3)

READ