

Maximize: $C = 2x + 5y$

Subject to:

- $x + y - 10 \leq 0$
- $x + y + 10 \geq 0$
- $2x - y - 10 \leq 0$
- $x - 3y + 15 \geq 0$

ERASE



1

Maximize: $C = 2x + 5y$

Subject to:

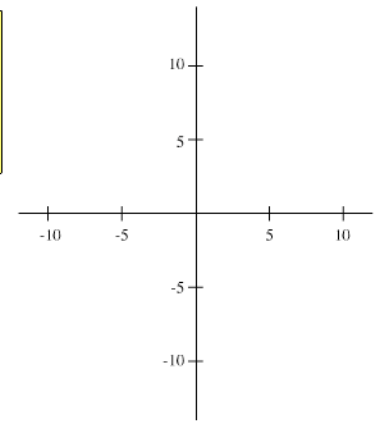
- $x + y - 10 \leq 0$
- $x + y + 10 \geq 0$
- $2x - y - 10 \leq 0$
- $x - 3y + 15 \geq 0$

1) $x + y - 10 = 0$

2) $x + y + 10 = 0$

3) $2x - y - 10 = 0$

4) $x - 3y + 15 = 0$



ERASE



2

Lecture 26

Maximize: $C = 2x + 5y$

Subject to:

- $x + y - 10 \leq 0$
- $x + y + 10 \geq 0$
- $2x - y - 10 \leq 0$
- $x - 3y + 15 \geq 0$

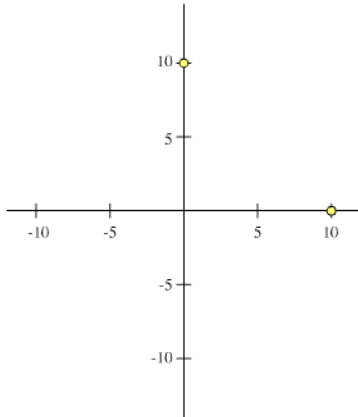
1) $x + y - 10 = 0$

(0, 10) (10, 0)

2) $x + y + 10 = 0$

3) $2x - y - 10 = 0$

4) $x - 3y + 15 = 0$



ERASE



3

Maximize: $C = 2x + 5y$

Subject to:

- $x + y - 10 \leq 0$
- $x + y + 10 \geq 0$
- $2x - y - 10 \leq 0$
- $x - 3y + 15 \geq 0$

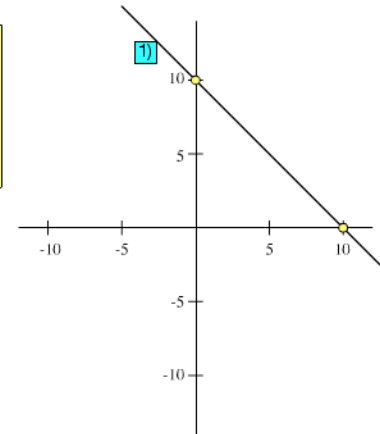
1) $x + y - 10 = 0$

(0, 10) (10, 0)

2) $x + y + 10 = 0$

3) $2x - y - 10 = 0$

4) $x - 3y + 15 = 0$



ERASE



4

Maximize: $C = 2x + 5y$

Subject to:

- $x + y - 10 \leq 0$
- $x + y + 10 \geq 0$
- $2x - y - 10 \leq 0$
- $x - 3y + 15 \geq 0$

1) $x + y - 10 = 0$

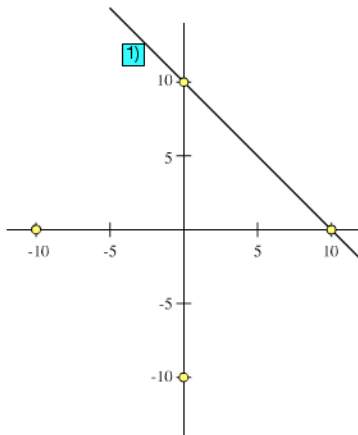
(0, 10) (10, 0)

2) $x + y + 10 = 0$

(0, -10) (-10, 0)

3) $2x - y - 10 = 0$

4) $x - 3y + 15 = 0$



ERASE



5

Maximize: $C = 2x + 5y$

Subject to:

- $x + y - 10 \leq 0$
- $x + y + 10 \geq 0$
- $2x - y - 10 \leq 0$
- $x - 3y + 15 \geq 0$

1) $x + y - 10 = 0$

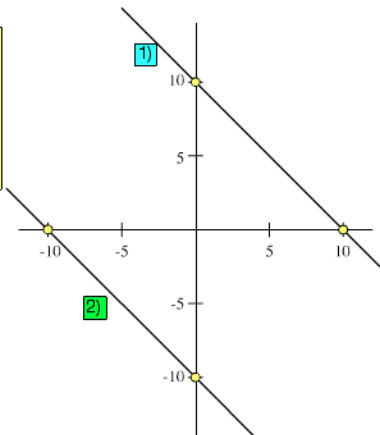
(0, 10) (10, 0)

2) $x + y + 10 = 0$

(0, -10) (-10, 0)

3) $2x - y - 10 = 0$

4) $x - 3y + 15 = 0$



ERASE



6

Maximize: $C = 2x + 5y$

Subject to:

- $x + y - 10 \leq 0$
- $x + y + 10 \geq 0$
- $2x - y - 10 \leq 0$
- $x - 3y + 15 \geq 0$

1) $x + y - 10 = 0$

(0, 10) (10, 0)

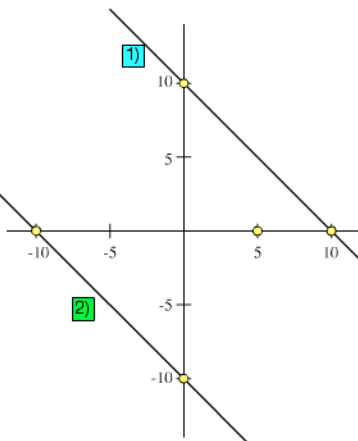
2) $x + y + 10 = 0$

(0, -10) (-10, 0)

3) $2x - y - 10 = 0$

(0, -10) (5, 0)

4) $x - 3y + 15 = 0$



ERASE



7

Maximize: $C = 2x + 5y$

Subject to:

- $x + y - 10 \leq 0$
- $x + y + 10 \geq 0$
- $2x - y - 10 \leq 0$
- $x - 3y + 15 \geq 0$

1) $x + y - 10 = 0$

(0, 10) (10, 0)

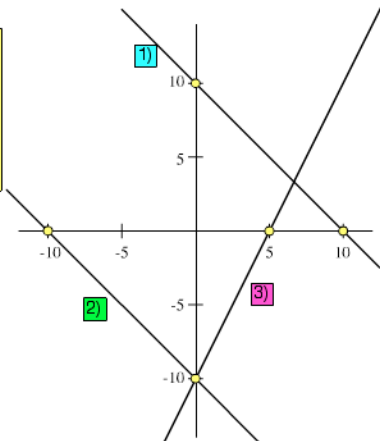
2) $x + y + 10 = 0$

(0, -10) (-10, 0)

3) $2x - y - 10 = 0$

(0, -10) (5, 0)

4) $x - 3y + 15 = 0$



ERASE



8

Maximize: $C = 2x + 5y$

Subject to:

- $x + y - 10 \leq 0$
- $x + y + 10 \geq 0$
- $2x - y - 10 \leq 0$
- $x - 3y + 15 \geq 0$

1) $x + y - 10 = 0$

(0, 10) (10, 0)

2) $x + y + 10 = 0$

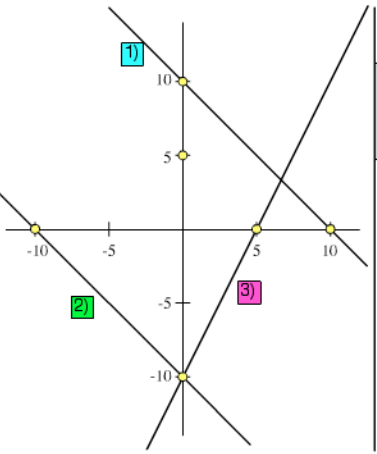
(0, -10) (-10, 0)

3) $2x - y - 10 = 0$

(0, -10) (5, 0)

4) $x - 3y + 15 = 0$

(-15, 0) (0, 5)



ERASE



9



Maximize: $C = 2x + 5y$

Subject to:

- $x + y - 10 \leq 0$
- $x + y + 10 \geq 0$
- $2x - y - 10 \leq 0$
- $x - 3y + 15 \geq 0$

1) $x + y - 10 = 0$

(0, 10) (10, 0)

2) $x + y + 10 = 0$

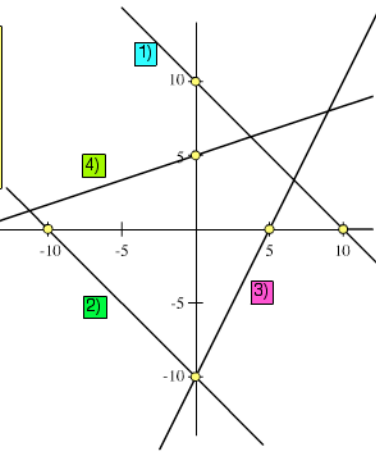
(0, -10) (-10, 0)

3) $2x - y - 10 = 0$

(0, -10) (5, 0)

4) $x - 3y + 15 = 0$

(-15, 0) (0, 5)



ERASE



10



Lecture 26

Maximize: $C = 2x + 5y$

Subject to:

- $x + y - 10 \leq 0$
- $x + y + 10 \geq 0$
- $2x - y - 10 \leq 0$
- $x - 3y + 15 \geq 0$

1) $x + y - 10 \leq 0$

(0, 0) works

2) $x + y + 10 \geq 0$

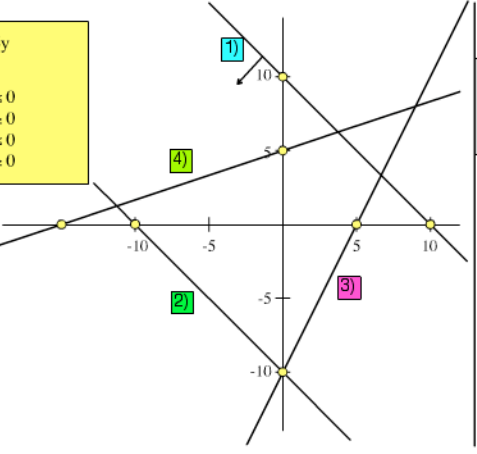
(0, 0) works

3) $2x - y - 10 \leq 0$

(0, 0) works

4) $x - 3y + 15 \geq 0$

(0, 0) works



ERASE



11



Maximize: $C = 2x + 5y$

Subject to:

- $x + y - 10 \leq 0$
- $x + y + 10 \geq 0$
- $2x - y - 10 \leq 0$
- $x - 3y + 15 \geq 0$

1) $x + y - 10 \leq 0$

(0, 0) works

2) $x + y + 10 \geq 0$

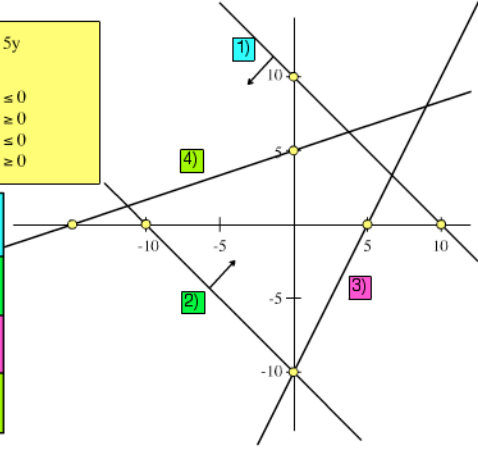
(0, 0) works

3) $2x - y - 10 \leq 0$

(0, 0) works

4) $x - 3y + 15 \geq 0$

(0, 0) works



ERASE



12



Maximize: $C = 2x + 5y$

Subject to:

- $x + y - 10 \leq 0$
- $x + y + 10 \geq 0$
- $2x - y - 10 \leq 0$
- $x - 3y + 15 \geq 0$

1) $x + y - 10 \leq 0$

(0, 0) works

2) $x + y + 10 \geq 0$

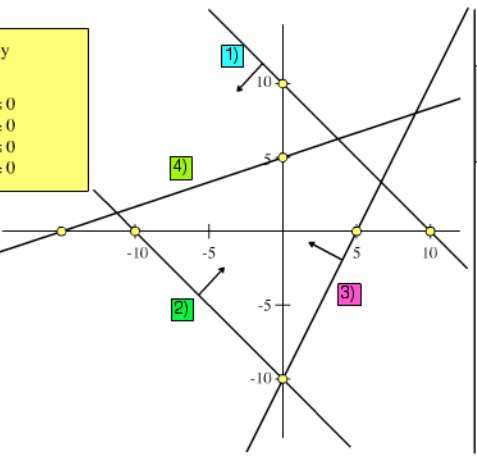
(0, 0) works

3) $2x - y - 10 \leq 0$

(0, 0) works

4) $x - 3y + 15 \geq 0$

(0, 0) works



ERASE



13



Maximize: $C = 2x + 5y$

Subject to:

- $x + y - 10 \leq 0$
- $x + y + 10 \geq 0$
- $2x - y - 10 \leq 0$
- $x - 3y + 15 \geq 0$

1) $x + y - 10 \leq 0$

(0, 0) works

2) $x + y + 10 \geq 0$

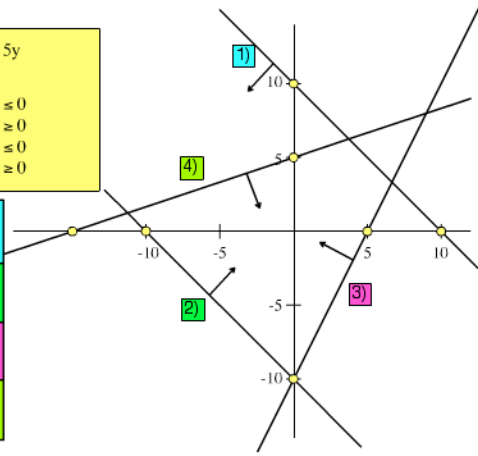
(0, 0) works

3) $2x - y - 10 \leq 0$

(0, 0) works

4) $x - 3y + 15 \geq 0$

(0, 0) works



ERASE



14



Maximize: $C = 2x + 5y$

Subject to:

- $x + y - 10 \leq 0$
- $x + y + 10 \geq 0$
- $2x - y - 10 \leq 0$
- $x - 3y + 15 \geq 0$

1) $x + y - 10 \leq 0$

(0, 0) works

2) $x + y + 10 \geq 0$

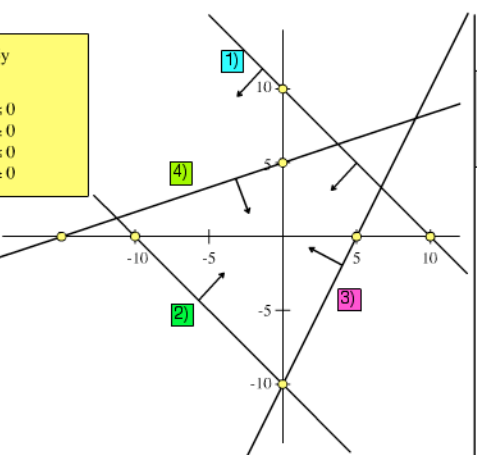
(0, 0) works

3) $2x - y - 10 \leq 0$

(0, 0) works

4) $x - 3y + 15 \geq 0$

(0, 0) works



ERASE



15



Maximize: $C = 2x + 5y$

Subject to:

- $x + y - 10 \leq 0$
- $x + y + 10 \geq 0$
- $2x - y - 10 \leq 0$
- $x - 3y + 15 \geq 0$

1) $x + y - 10 \leq 0$

(0, 0) works

2) $x + y + 10 \geq 0$

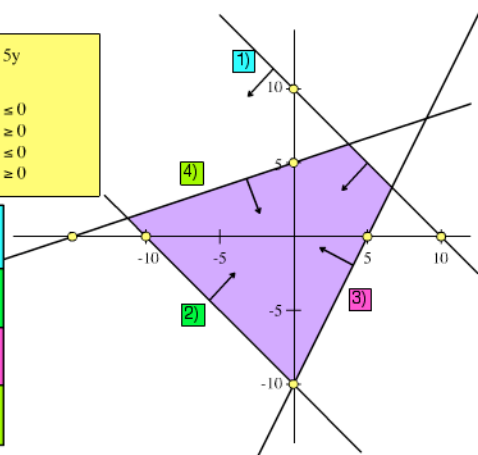
(0, 0) works

3) $2x - y - 10 \leq 0$

(0, 0) works

4) $x - 3y + 15 \geq 0$

(0, 0) works



ERASE



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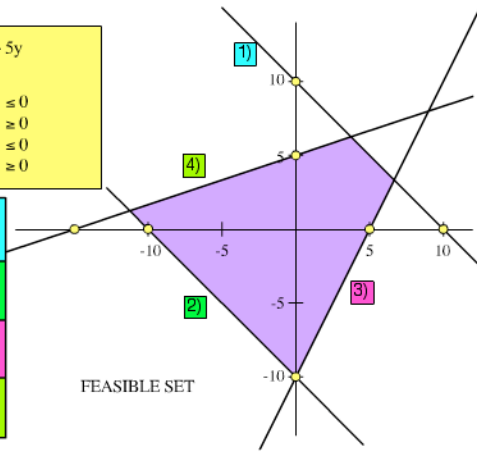
Maximize: $C = 2x + 5y$

Subject to:

- 1) $x + y - 10 \leq 0$
- 2) $x + y + 10 \geq 0$
- 3) $2x - y - 10 \leq 0$
- 4) $x - 3y + 15 \geq 0$

- 1) $x + y - 10 \leq 0$
(0, 0) works
- 2) $x + y + 10 \geq 0$
(0, 0) works
- 3) $2x - y - 10 \leq 0$
(0, 0) works
- 4) $x - 3y + 15 \geq 0$
(0, 0) works

FEASIBLE SET



ERASE



17



Maximize: $C = 2x + 5y$

Subject to:

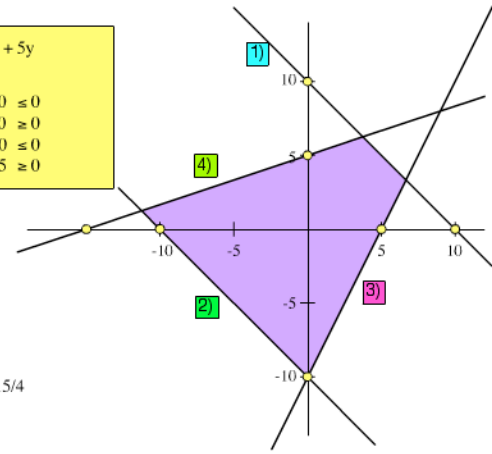
- 1) $x + y - 10 \leq 0$
- 2) $x + y + 10 \geq 0$
- 3) $2x - y - 10 \leq 0$
- 4) $x - 3y + 15 \geq 0$

1) \cap 4)

$$\begin{aligned} x + y &= 10 \\ x - 3y &= -15 \\ \hline 4y &= 25 \end{aligned}$$

$$y = 25/4$$

$$x = 10 - 25/4 = 15/4$$



ERASE



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Lecture 26

Maximize: $C = 2x + 5y$

Subject to:

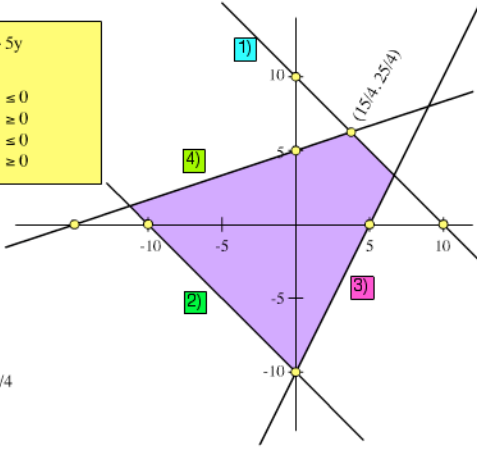
- 1) $x + y - 10 \leq 0$
- 2) $x + y + 10 \geq 0$
- 3) $2x - y - 10 \leq 0$
- 4) $x - 3y + 15 \geq 0$

1) \cap 4)

$$\begin{aligned} x + y &= 10 \\ x - 3y &= -15 \\ \hline 4y &= 25 \end{aligned}$$

$$y = 25/4$$

$$x = 10 - 25/4 = 15/4$$



ERASE



19



Maximize: $C = 2x + 5y$

Subject to:

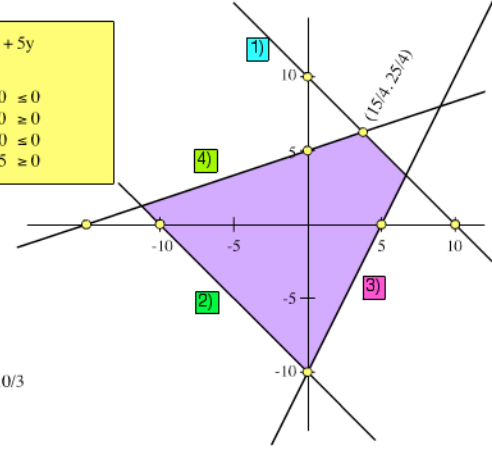
- 1) $x + y - 10 \leq 0$
- 2) $x + y + 10 \geq 0$
- 3) $2x - y - 10 \leq 0$
- 4) $x - 3y + 15 \geq 0$

1) \cap 3)

$$\begin{aligned} x + y &= 10 \\ 2x - y &= 10 \\ \hline 3x &= 20 \end{aligned}$$

$$x = 20/3$$

$$y = 10 - 20/3 = 10/3$$



ERASE



20



Maximize: $C = 2x + 5y$

Subject to:

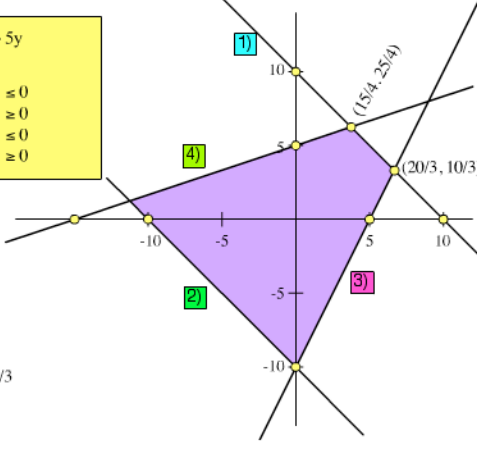
- 1) $x + y - 10 \leq 0$
- 2) $x + y + 10 \geq 0$
- 3) $2x - y - 10 \leq 0$
- 4) $x - 3y + 15 \geq 0$

1) \cap 3)

$$\begin{aligned} x + y &= 10 \\ 2x - y &= 10 \\ \hline 3x &= 20 \end{aligned}$$

$$x = 20/3$$

$$y = 10 - 20/3 = 10/3$$



ERASE



21



Maximize: $C = 2x + 5y$

Subject to:

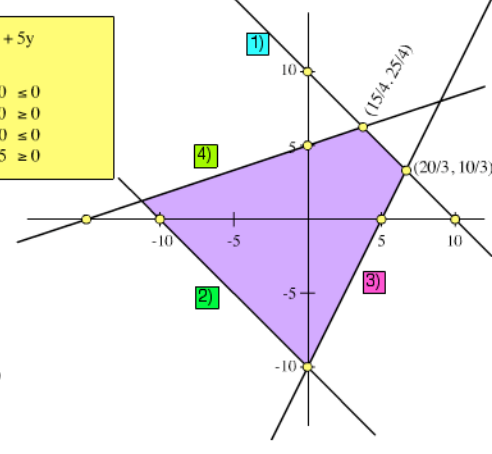
- 1) $x + y - 10 \leq 0$
- 2) $x + y + 10 \geq 0$
- 3) $2x - y - 10 \leq 0$
- 4) $x - 3y + 15 \geq 0$

2) \cap 3)

$$\begin{aligned} x + y &= -10 \\ 2x - y &= 10 \\ \hline 3x &= 0 \end{aligned}$$

$$x = 0$$

$$y = -10 - 0 = -10$$



ERASE



22



Maximize: $C = 2x + 5y$

Subject to:

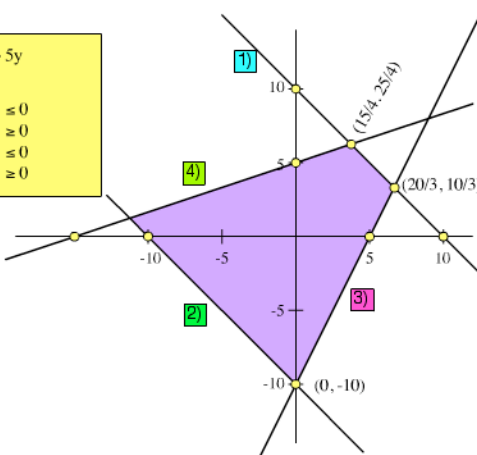
- 1) $x + y - 10 \leq 0$
- 2) $x + y + 10 \geq 0$
- 3) $2x - y - 10 \leq 0$
- 4) $x - 3y + 15 \geq 0$

2) \cap 3)

$$\begin{aligned} x + y &= -10 \\ 2x - y &= 10 \\ \hline 3x &= 0 \end{aligned}$$

$$x = 0$$

$$y = -10 - 0 = -10$$



ERASE



23



Maximize: $C = 2x + 5y$

Subject to:

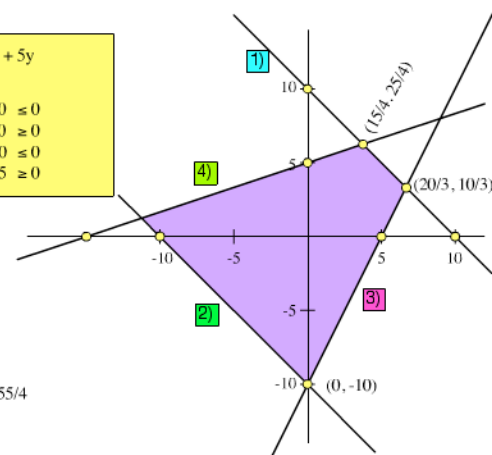
- 1) $x + y - 10 \leq 0$
- 2) $x + y + 10 \geq 0$
- 3) $2x - y - 10 \leq 0$
- 4) $x - 3y + 15 \geq 0$

2) \cap 4)

$$\begin{aligned} x + y &= -10 \\ x - 3y &= -15 \\ \hline 4y &= 5 \end{aligned}$$

$$y = 5/4$$

$$x = -10 - 5/4 = -55/4$$

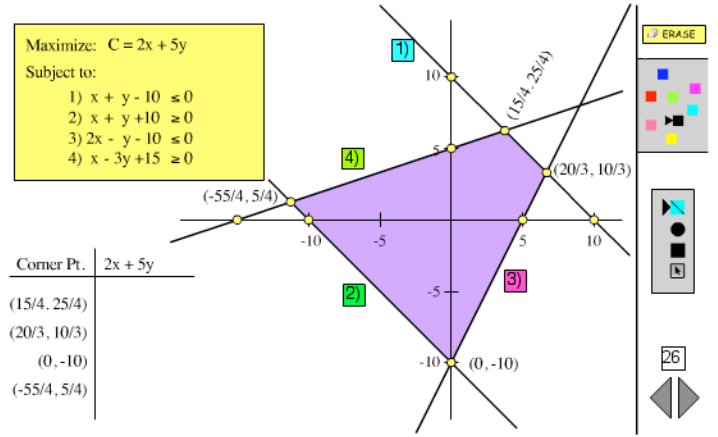
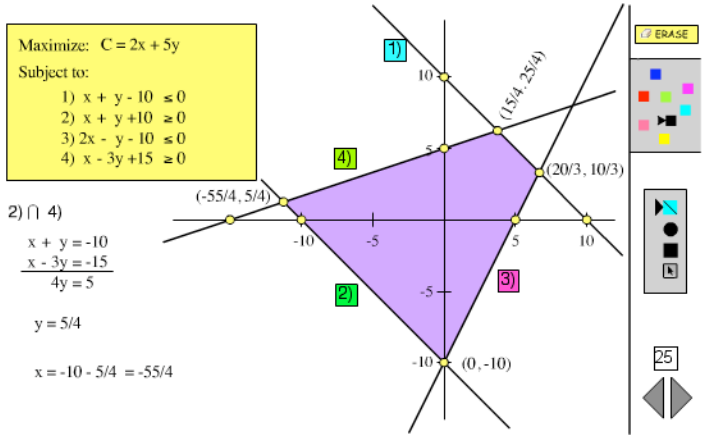


ERASE

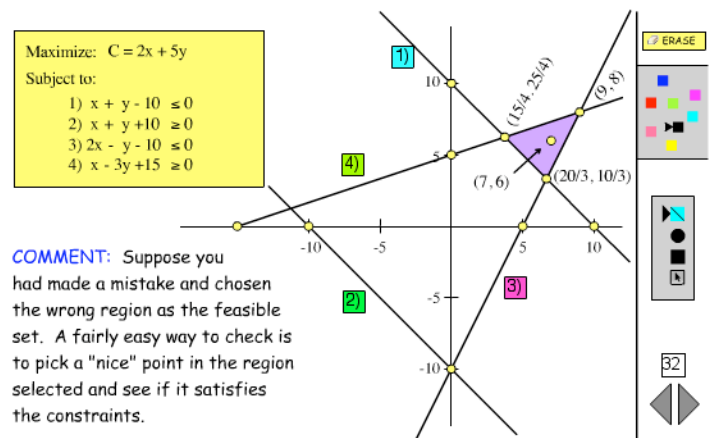
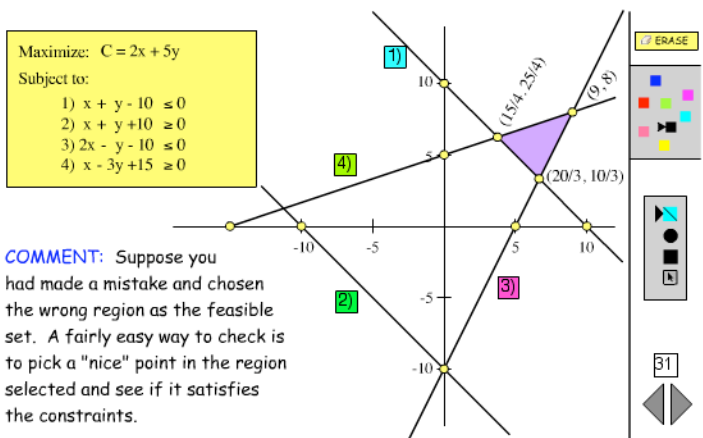
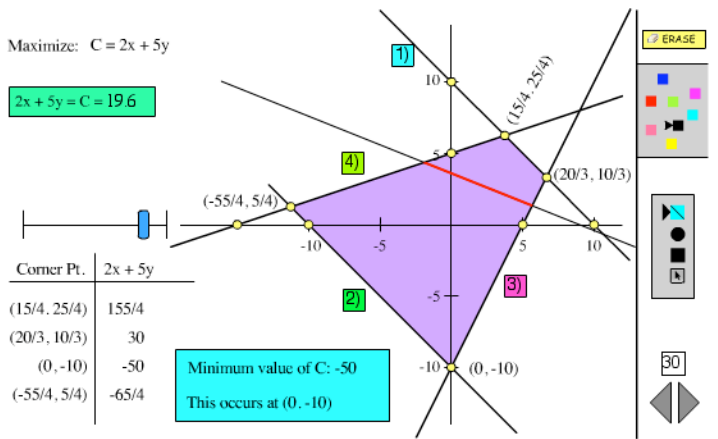
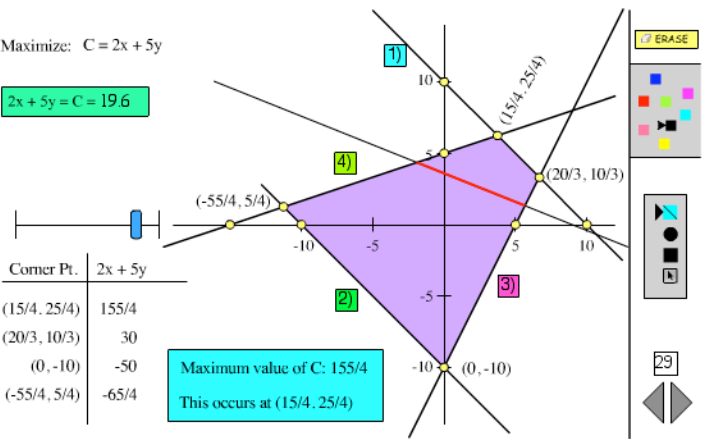
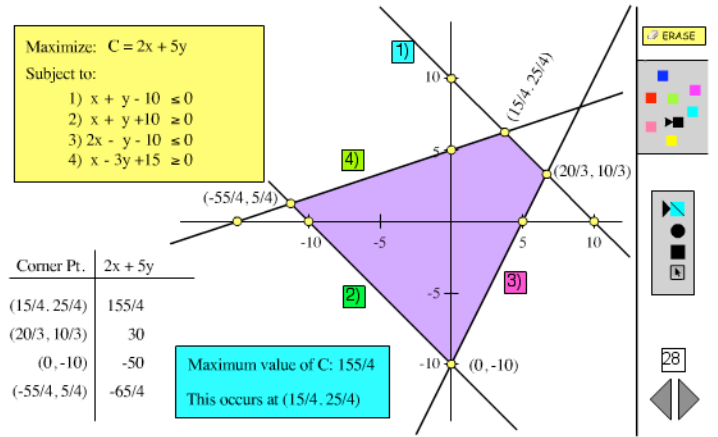
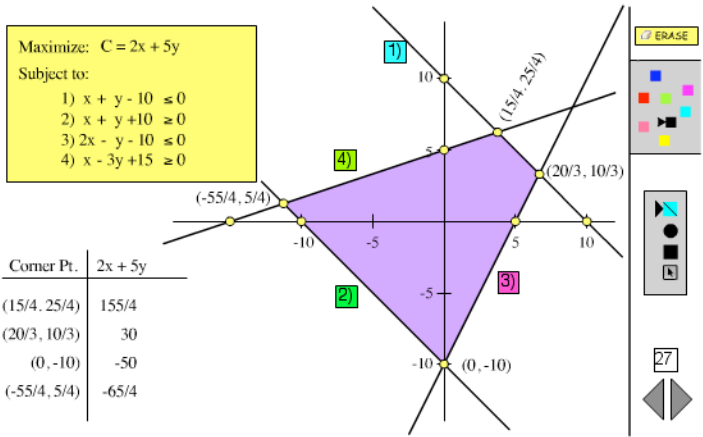


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Lecture 26



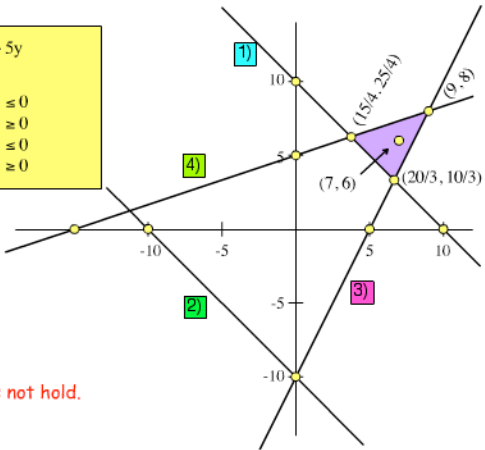
Maximize: $C = 2x + 5y$

Subject to:

- 1) $x + y - 10 \leq 0$
- 2) $x + y + 10 \geq 0$
- 3) $2x - y - 10 \leq 0$
- 4) $x - 3y + 15 \geq 0$

- 1) $7 + 6 - 10 \leq 0$
- 2) $7 + 6 + 10 \geq 0$
- 3) $14 - 6 - 10 \leq 0$
- 4) $7 - 18 + 15 \geq 0$

Constraint 1) does not hold.



ERASE



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Lecture 26

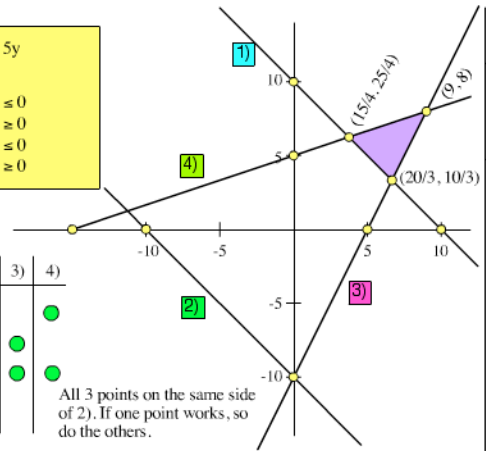
Maximize: $C = 2x + 5y$

Subject to:

- 1) $x + y - 10 \leq 0$
- 2) $x + y + 10 \geq 0$
- 3) $2x - y - 10 \leq 0$
- 4) $x - 3y + 15 \geq 0$

Corner Pt.	1)	2)	3)	4)
(15/4, 25/4)	●	●	●	●
(20/3, 10/3)	●	●	●	●
(9, 8)	●	●	●	●

All 3 points on the same side of 2). If one point works, so do the others.



ERASE



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Maximize: $C = 2x + 5y$

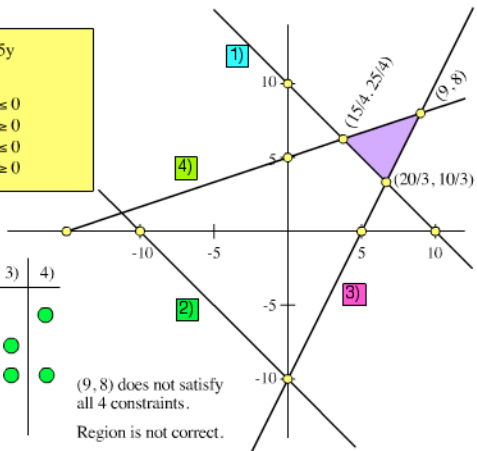
Subject to:

- 1) $x + y - 10 \leq 0$
- 2) $x + y + 10 \geq 0$
- 3) $2x - y - 10 \leq 0$
- 4) $x - 3y + 15 \geq 0$

Corner Pt.	1)	2)	3)	4)
(15/4, 25/4)	●	●	●	●
(20/3, 10/3)	●	●	●	●
(9, 8)	●	●	●	●

(9, 8) does not satisfy all 4 constraints.

Region is not correct.



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ERASE



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ERASE



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ERASE



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ERASE



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ERASE



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