Algebra
WS systems of inequalities

NAME_____

period_____

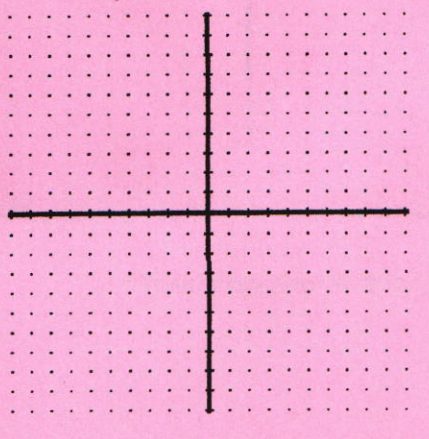
How to graph a SYSTEM OF INEQUALITIES

A System of Inequalities is a problem that looks like this: $x+y\le 8,\ \textit{and}\ y\ge 3\ \textit{and}\ x\ge 2$

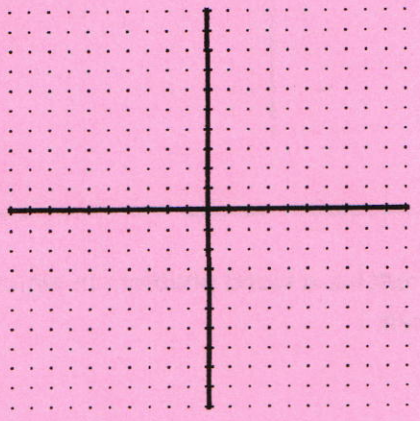
To graph a system like this we are going to graph the three inequalities separately.

Graph each of the following:

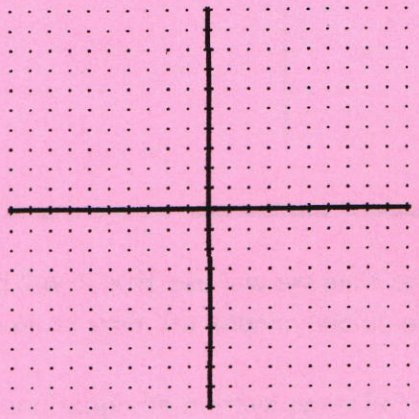
#1 $x+y<8$



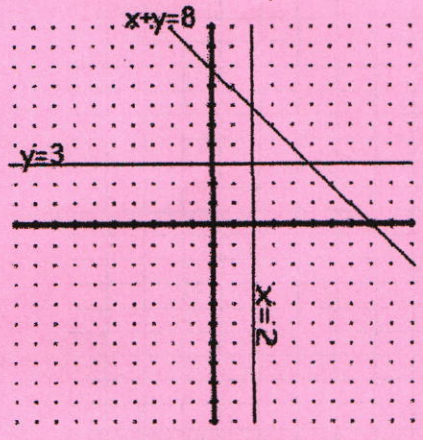
#2 $y\ge 3$



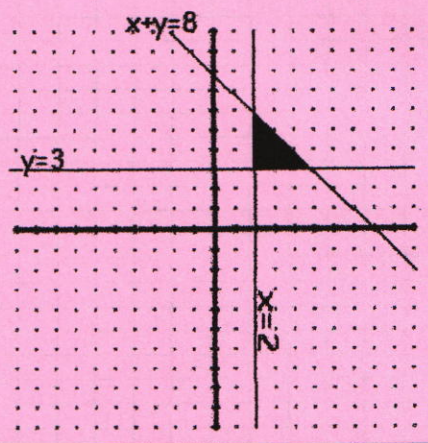
#3 $x\ge 2$



But, since this is a system of equations, we want to put all of these equations on a single graph:

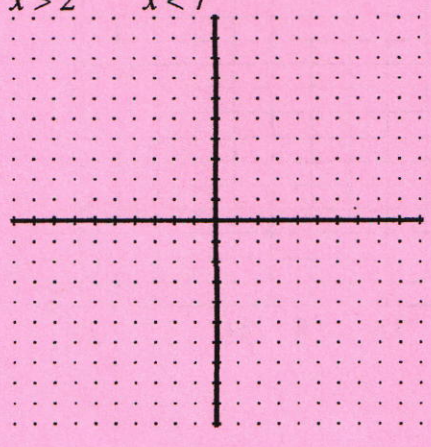


Then, we want to shade only the part of the graph that is shaded by all 3 graphs

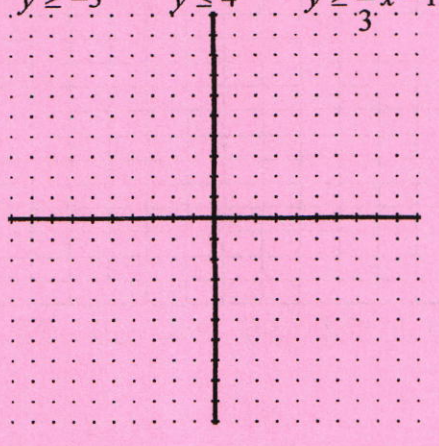


Graph each of the following systems of inequalities in the graph given.

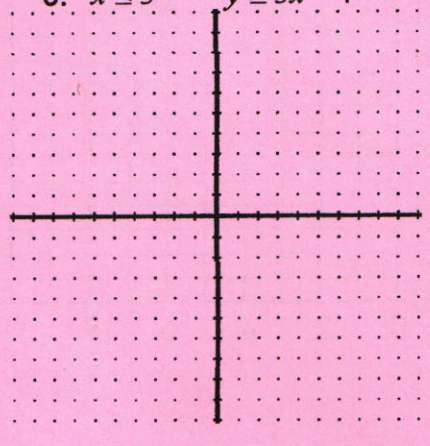
4. $x>2$ $x<7$



5. $y\ge -3$ $y\le 4$ $y\ge \frac{1}{3}x-1$



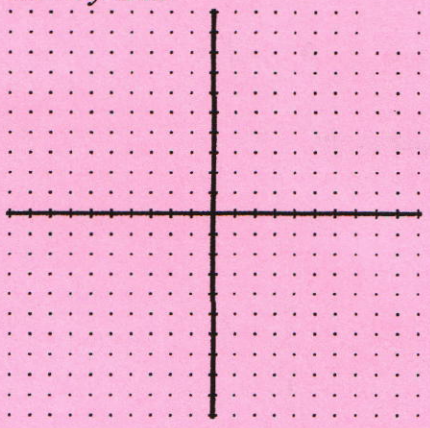
6. $x\le 5$ $y\ge 3x-4$



Graph each of the following systems of equations:

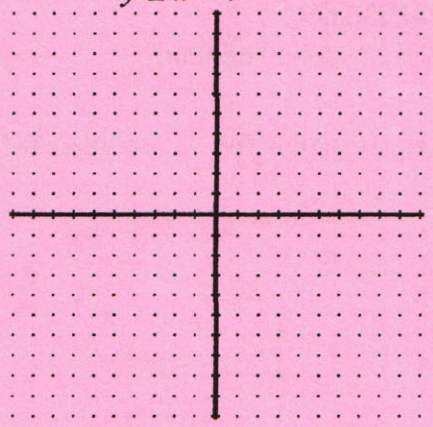
7 $4 \geq y \geq 2$

$2x + 3y \geq 12$



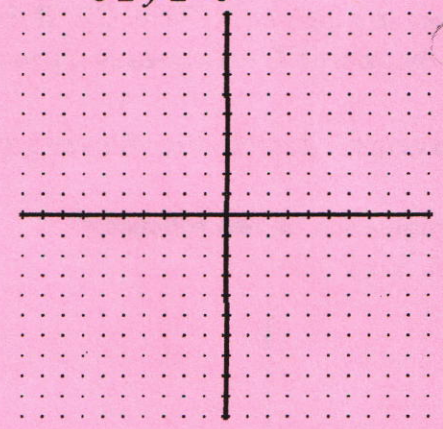
8. $-3 < y < -1$

$y \geq x - 4$



9. $6 \geq x \geq 4$

$3 \geq y \geq -6$



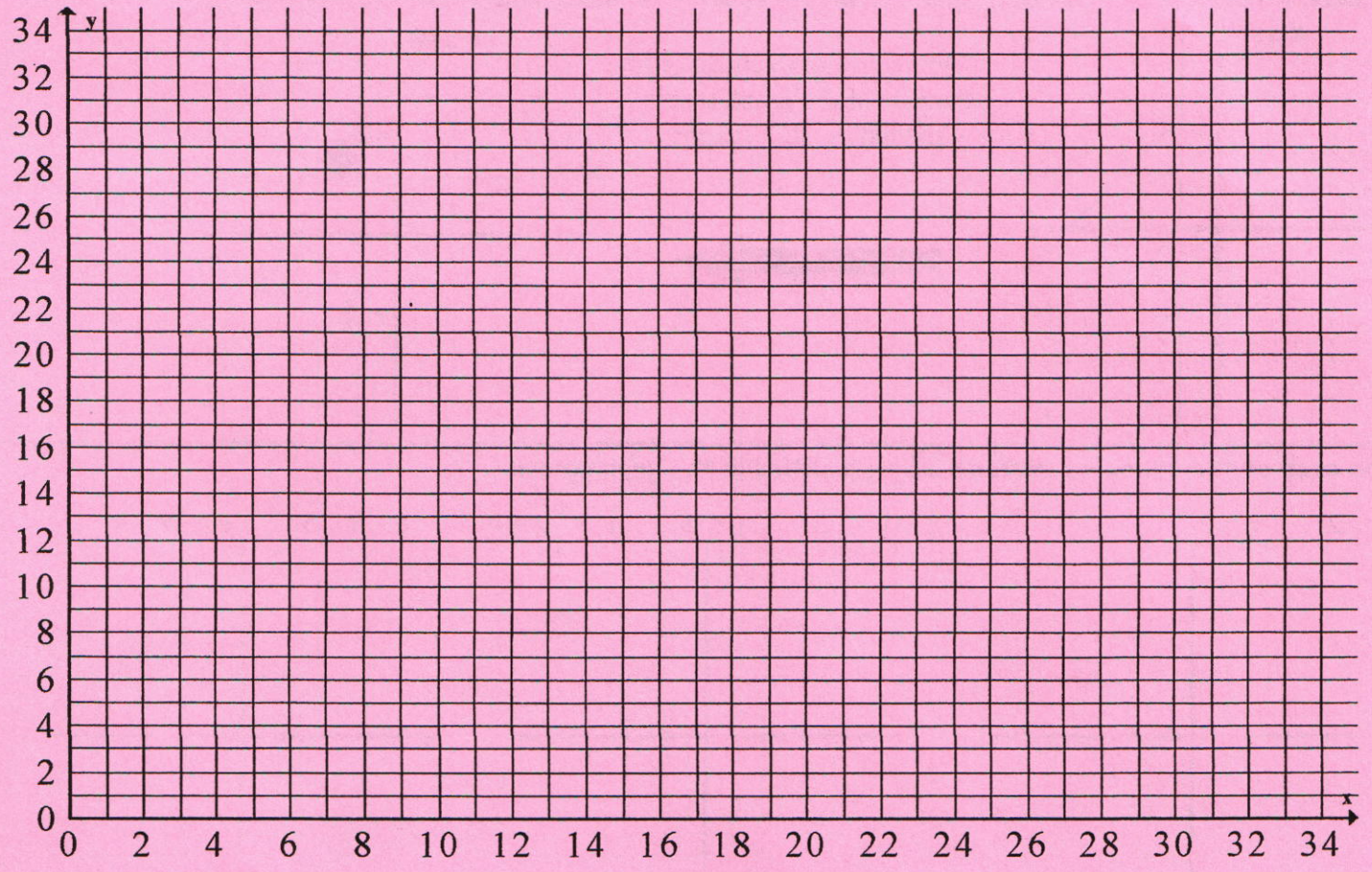
Most of the time we will use this it will be to resolve a word problem in which negative answers won't make sense so our graphs will only be in quadrant 1

Graph the following system of equations:

$x + y \leq 30$

$x \leq 12$

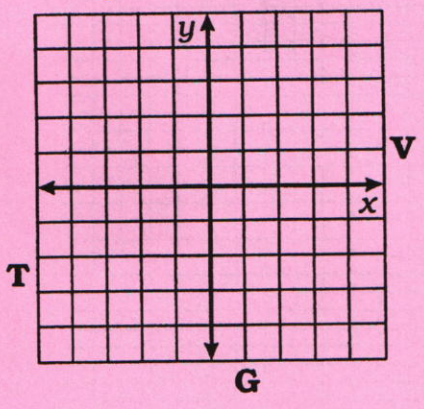
$6x + 10y \geq 90$



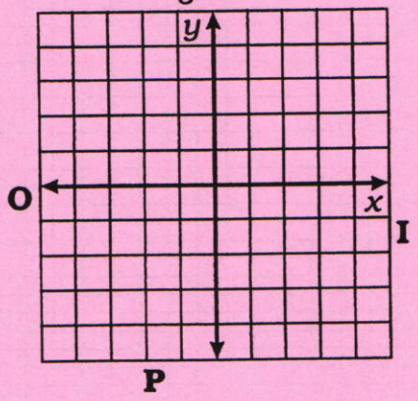
Which Member of Fred Ferd's Family Thinks He's a Pen?

Show the solution region for each system with crosshatching or shading. The crosshatching or shading, if extended, would cover a letter. Write this letter in each box with the exercise number.

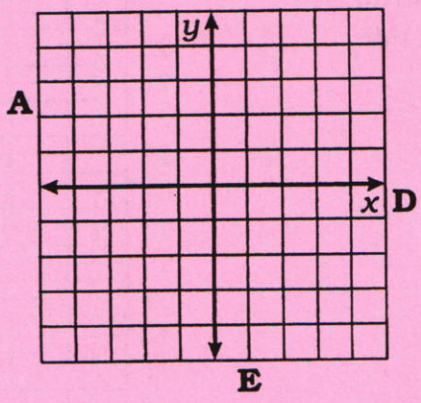
1. $y \geq \frac{3}{4}x - 2$
$y \leq 1$



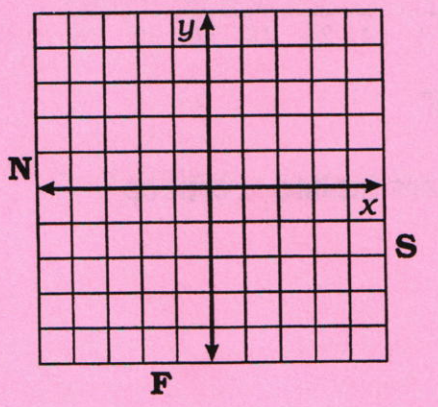
2. $y \geq -2x - 3$
$y \leq \frac{1}{3}x + 2$



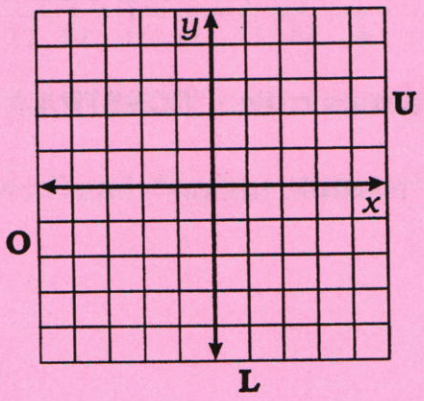
3. $y < \frac{3}{2}x + 3$
$y < -x + 1$



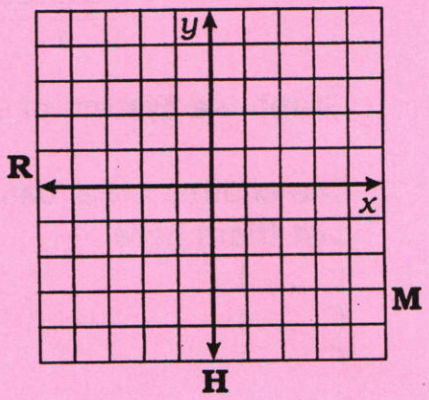
4. $y \leq x$
$5x + 3y > -6$



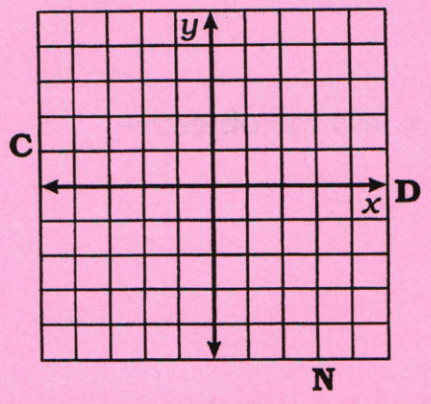
5. $y + 3 > 0$
$-2x - 5y \geq 5$



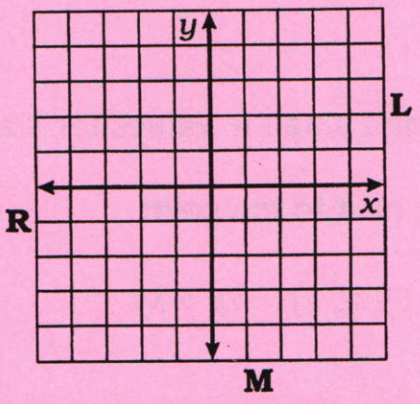
6. $x < 2$
$x - 2y > 6$



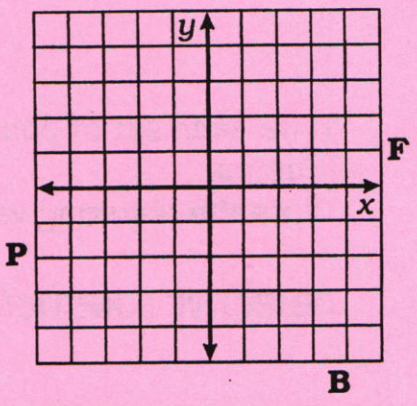
7. $8x + 12y < 24$
$35x - 20y \leq 80$



8. $10x + 10y \leq 30$
$y - 3x > 0$



9. $y + 2 \leq 0$
$2 - x \leq 0$



6	2	4	9	2	7	9	8	5	1	6	3	8

Graphing Systems Of Inequalities Pt. 2
LINEAR PROGRAMING

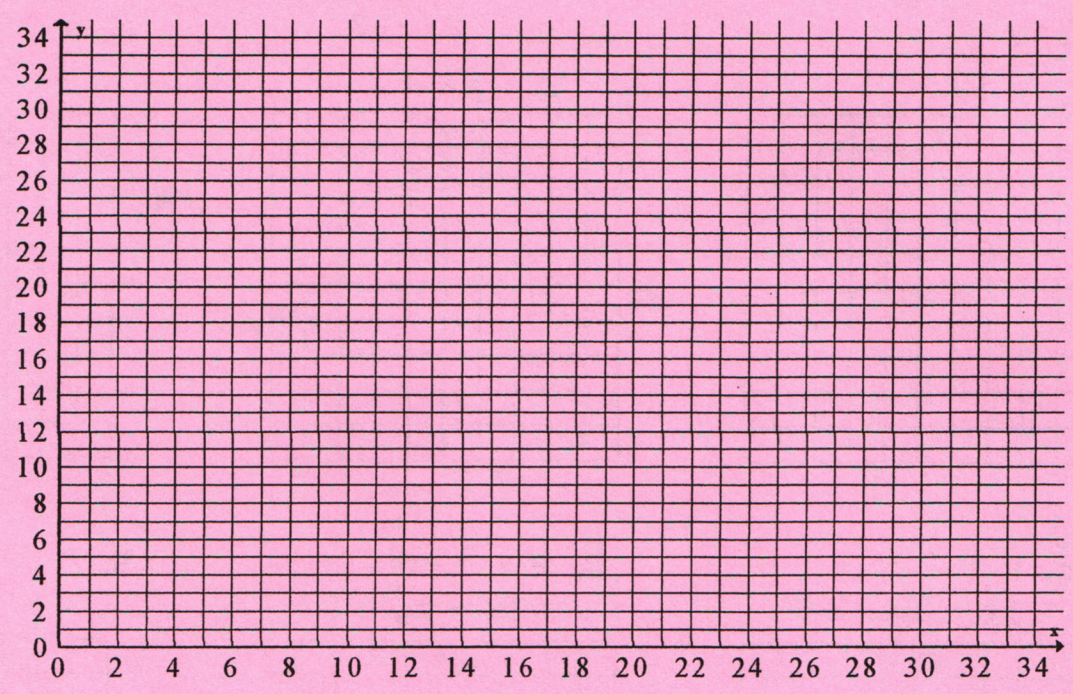
Linear Programming: is full of strange steps:

Constraints:

$4x + 5y \leq 100$

$y \leq x + 11$

$x \leq 10$



Step 1: Graph the system of equations called "CONSTRAINTS"

Step 2: The shaded area (called "feasible region") has 5 corners (called "vertices")
List them here

(,)
(,)
(,)
(0, 0)
(,)

Step 3: Take each set of points and plug the values for X and Y into the objective function.
Write the resulting value next to the point

OBJECTIVE FUNCTION: $f(x, y) = 5x + 3y$

Step 4: Which point gives the highest value in the objective function? _____

Which point gives the lowest value in the objective function? _____

A2H NAME_____

Linear Programming WS #1 Period_____

1. **Graph and shade the constraints (restrictions).**
2. **Find the vertices of the shaded region (feasible region).**
3. **Evaluate each vertex in the objective function.**
4. **Identify which vertex provides the maximum value and minimum value in the objective function.**

Objective Function:

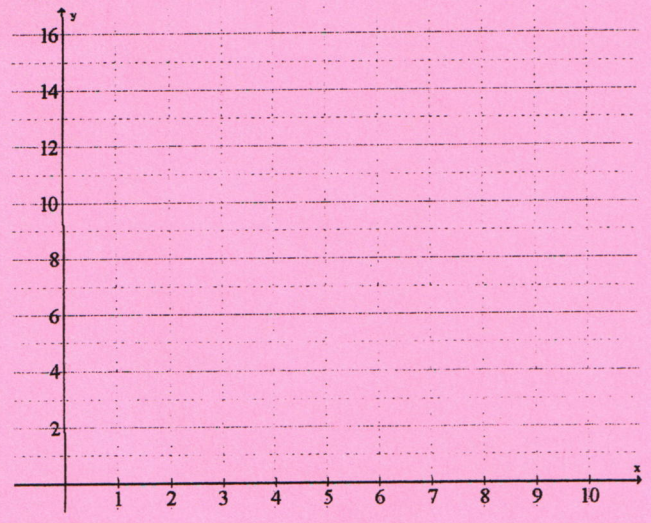
$2x+5y=$

Constraints:

$y \le 13$

$x \le 9$

$y \ge x$



Vertices: (,) →
(,) →
(,) →
(,) →

Which vertex gives the max value?

Which vertex gives the min value?

Objective Function:

$5x-y=$

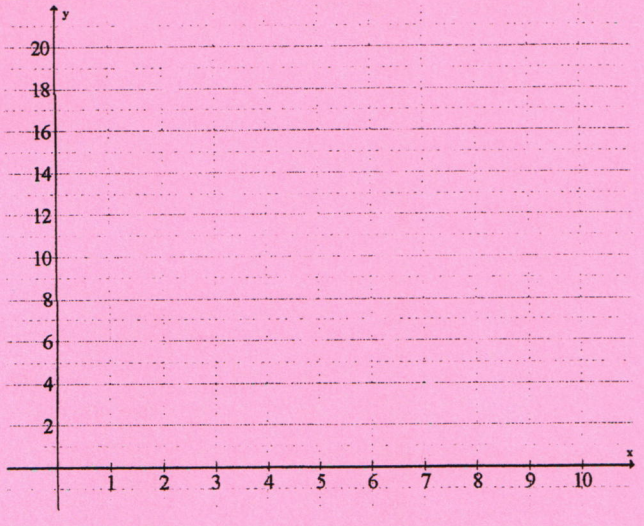
Constraints:

$y \le 12$

$y \le -2x+16$

$y \ge -0.5x+3$

$y \ge 2x-12$



Vertices: (,) →
(,) →
(,) →
(,) →
(,) →

Which vertex gives the max value?

Which vertex gives the min value?

Objective Function:

$6x+3y=$

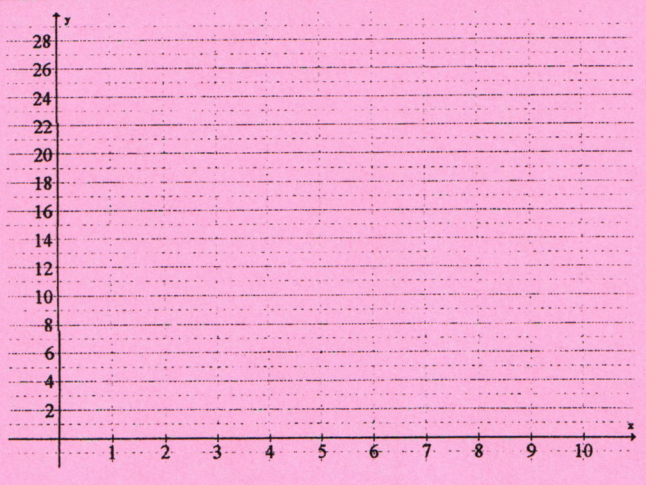
Constraints:

$3x+y \le 27$

$2x-y \ge -7$

$y \le 9$

$y \ge -x+7$



Vertices: (,) →
(,) →
(,) →
(,) →
(,) →

Which vertex gives the max value?

Which vertex gives the min value?