* BQ # 1@1

6.6 Systems of Linear Inequalities

* System of linear inequalities
  - two or more linear inequalities
  - the solution is an ordered pair that makes all the inequalities in the system true
  - the graph represents all of the solutions of the system (where the shadings overlap, also consider whether the boundary line is solid or dashed)
* Highlight the final solution.

* Examples:

  Graph

  (A) $y > 4x - 1$
  $y < -2x + 3$

  (B) $y \leq -x + 1$
  $y \geq x$

(See attached graphs)

*Make sure to test a pt. to check your answer!

* Review Problem 2 "Writing a System of Linear Inequalities from a Graph" on pg. 401

* Got it 2a) $y \leq \frac{1}{2}x + 1$ (Blue Line)
$y < -\frac{1}{2}x + 1$ (Red Line)

b) No; the red line is dashed, so points on that boundary line are not included in the solution. (Both boundary lines must be solid ($\geq$ or $\leq$), in order for the part of intersection to be considered part of the solution.)

* Review Problem 3 "Using a System of Inequalities" on pg. 402.

* Got it #3) $P = 2l + 2w$

$126 \geq 2l + 2w \Rightarrow$ Rewrite to graph

$10 \leq w$

$50 \geq l$

$\frac{126 - 2l}{2} \geq \frac{2w}{2}$

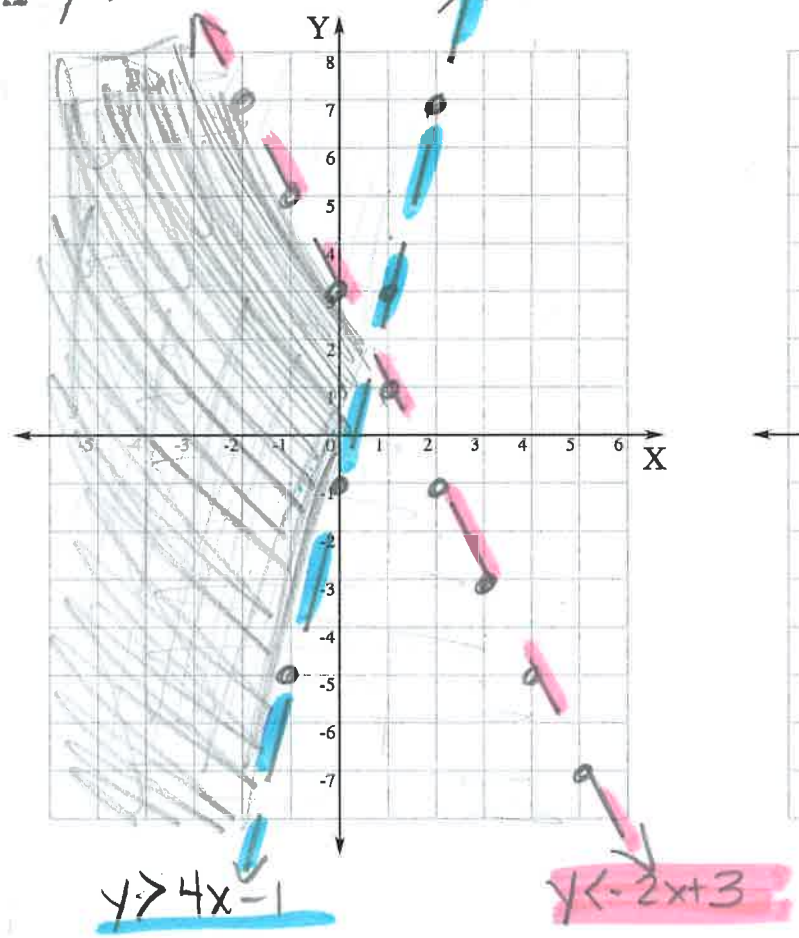
$63 - l \geq w$

$w \leq -l + 63$

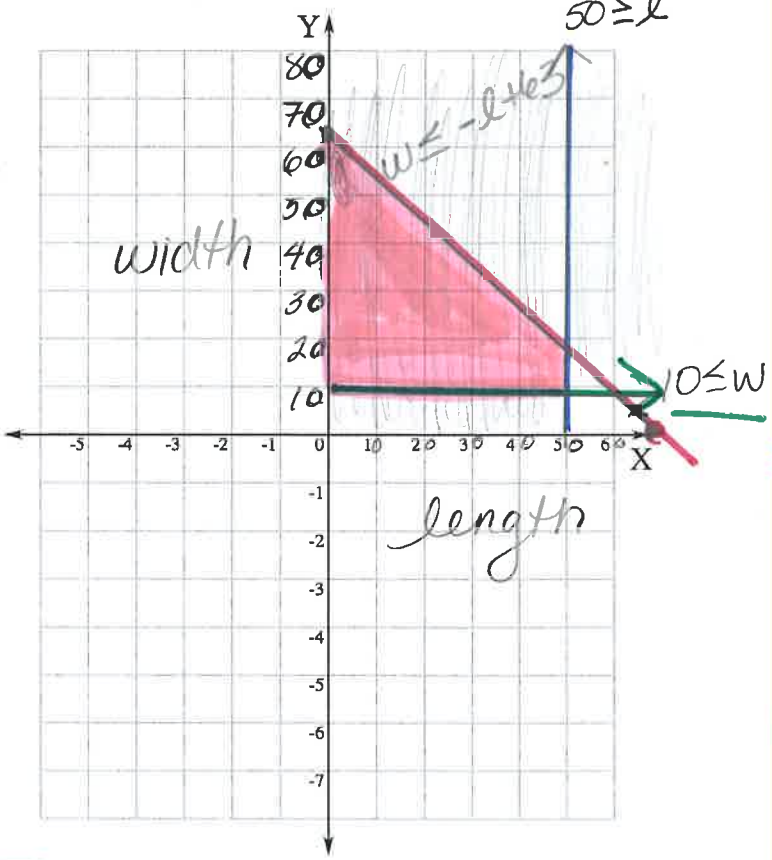
See attached Graph

(A) pg.422 $y > 4x - 1$ TEST (0,0) $0 > -1$ YES

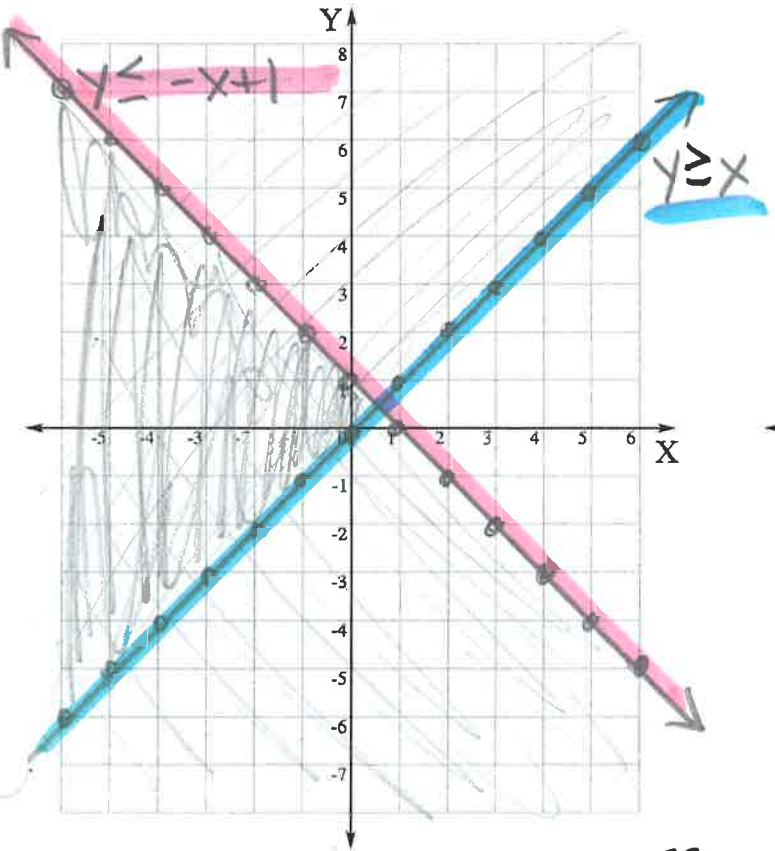
$y < -2x + 3$ TEST (0,0) $0 < 3$ YES

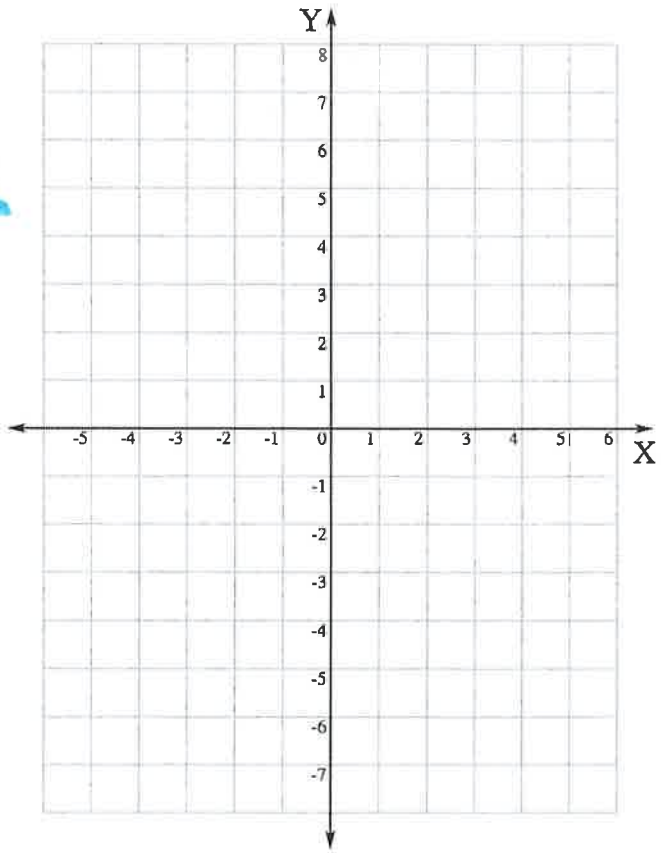


Got it #3 pg. 402



(B)





$y \geq x$ TEST (3,0) $0 \geq 3$ FALSE

$y \leq -x + 1$ TEST (0,0) $0 \leq 1$ TRUE

6.6 pg. 402 #4-10all, 12-24 even (skip 20) & 32

4) Substitute the ordered pair into each inequality to make sure that it makes each true.

5) Not necessarily; as long as there is some overlap of the half-planes, then the system will have a solution

6) Same => Need to find the intersection of each of the two systems

Different => Equations need to find the intersection of the lines
Inequalities - need to find the intersection of a line or section on the graph

7) (2,12) - TRUE

$y > 2x+4$	$y < 3x+7$
$12 > 2(2)+4$	$12 < 3(2)+7$
$12 > 4+4$	$12 < 6+7$
$12 > 8$	$12 < 13$
YES	YES

(8,2) False

8) $3(8)-2(2)\leq 17$

$24-4\leq 17$

$20\leq 17$

(-3,17) False ~~TRUE~~

9) $y>-5x+2$ $\quad y=3x+7$

$17>-5(3)+2$ $\quad 17\geq -3(-3)+7$

$17>+15+2$ $\quad 17\geq 9+7$

$17>-17$ $\quad 17\geq -16$

10-20) EVEN ON GRAPHS

10) $y<2x+4$

$-3x-2y\geq 6$

$+3x \quad +3x$

$-2y\geq 3x+6$

$\frac{-2y}{-2}\geq\frac{3x+6}{-2}$

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

12) $y>2x+4$

$2x-y\leq 4$

$-2x \quad -2x$

$-1(-y\leq -2x+4)$

$y\geq +2x+-4$

16) $x+2y\leq 10$

$-x \quad -x$

$\frac{2y}{2}\leq\frac{-x+10}{2}$

$y\leq -\frac{1}{2}x+5$

$x+2y\geq 9$

$-x \quad -x$

$\frac{2y}{2}\geq\frac{-x+9}{2}$

$y\geq -\frac{1}{2}x+\frac{9}{2}$

20) $2x-4y<1$

$-2x \quad -2x$

$-4(-\frac{1}{4}y<-2x+1)$

$y>+8x+-4$

$4x+8y>4$

$\frac{8y}{8}>\frac{-4x+4}{8}$

$y>-\frac{1}{2}x+\frac{1}{2}$

< or ≤ below
> or ≥ above

22) $y \geq -2x + 2$
$y < 3x - 2$

$0 < 3(3) - 2$
$0 < 9 - 2$
$0 < 7$

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

$x < 1$
$0 < 1$

32) (A) $x \geq 2$
$y \geq 3$
$y \leq -x + 4$
} See graph

(B) Rt. triangle

(C) (2, 2), (2, −3), (7, −3)

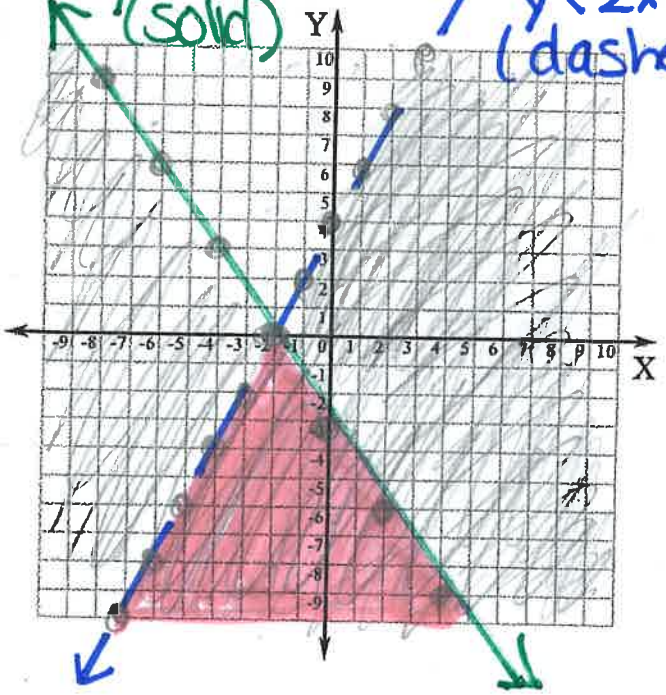
(D) $A = \frac{1}{2}bh$
$A = \frac{1}{2}(5)(5)$
$A = \frac{1}{2}(25)$
$A = 12\frac{1}{2}$ unit^2

$<$ or $\leq$ below

$>$ or $\geq$ above

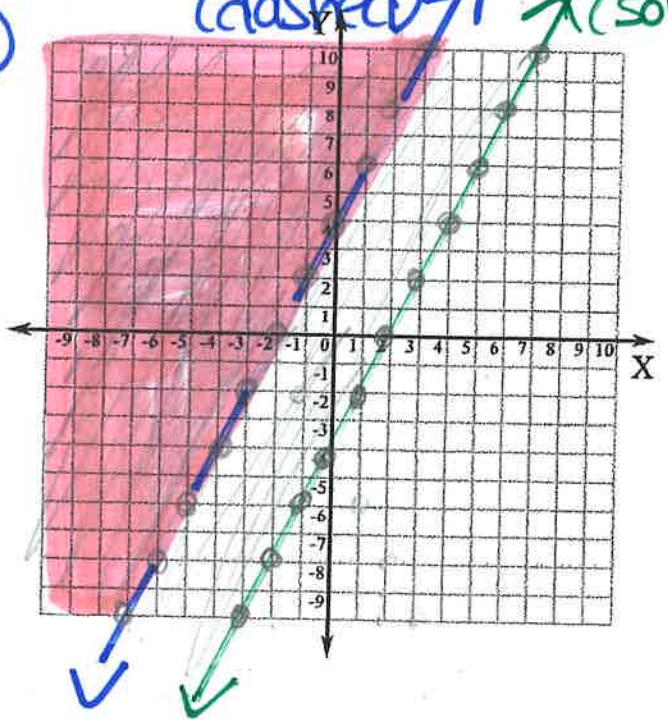
10) $y \leq -\frac{3}{2}x+3$ (solid)

$y<2x+4$ (dashed)



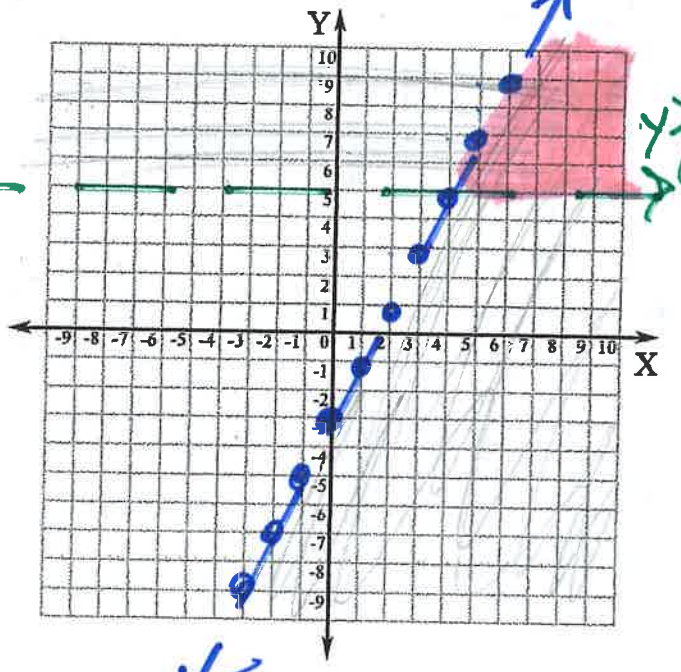
12) $y>2x+4$ (dashed)

$y \geq 2x+-4$ (solid)



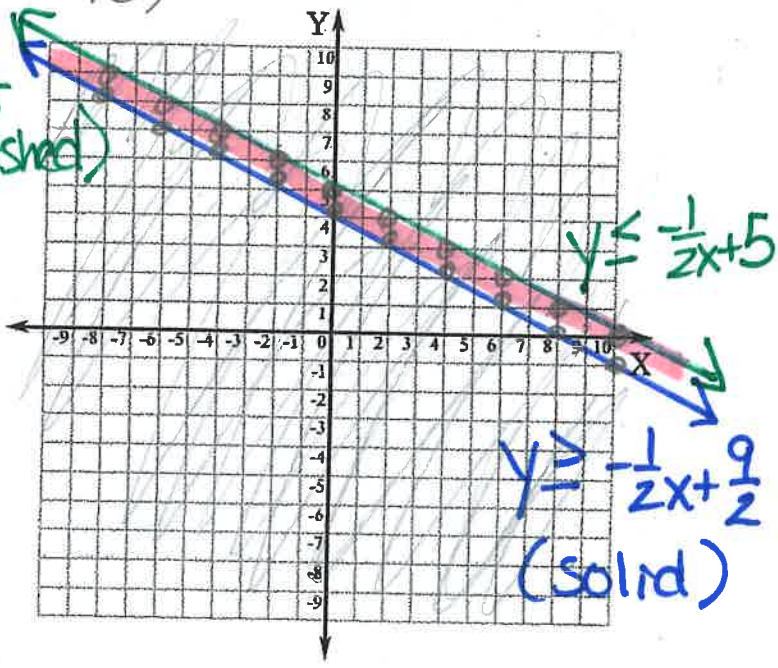
14)

$y>5$ (dashed)



$y<2x-3$ (dashed)

16)



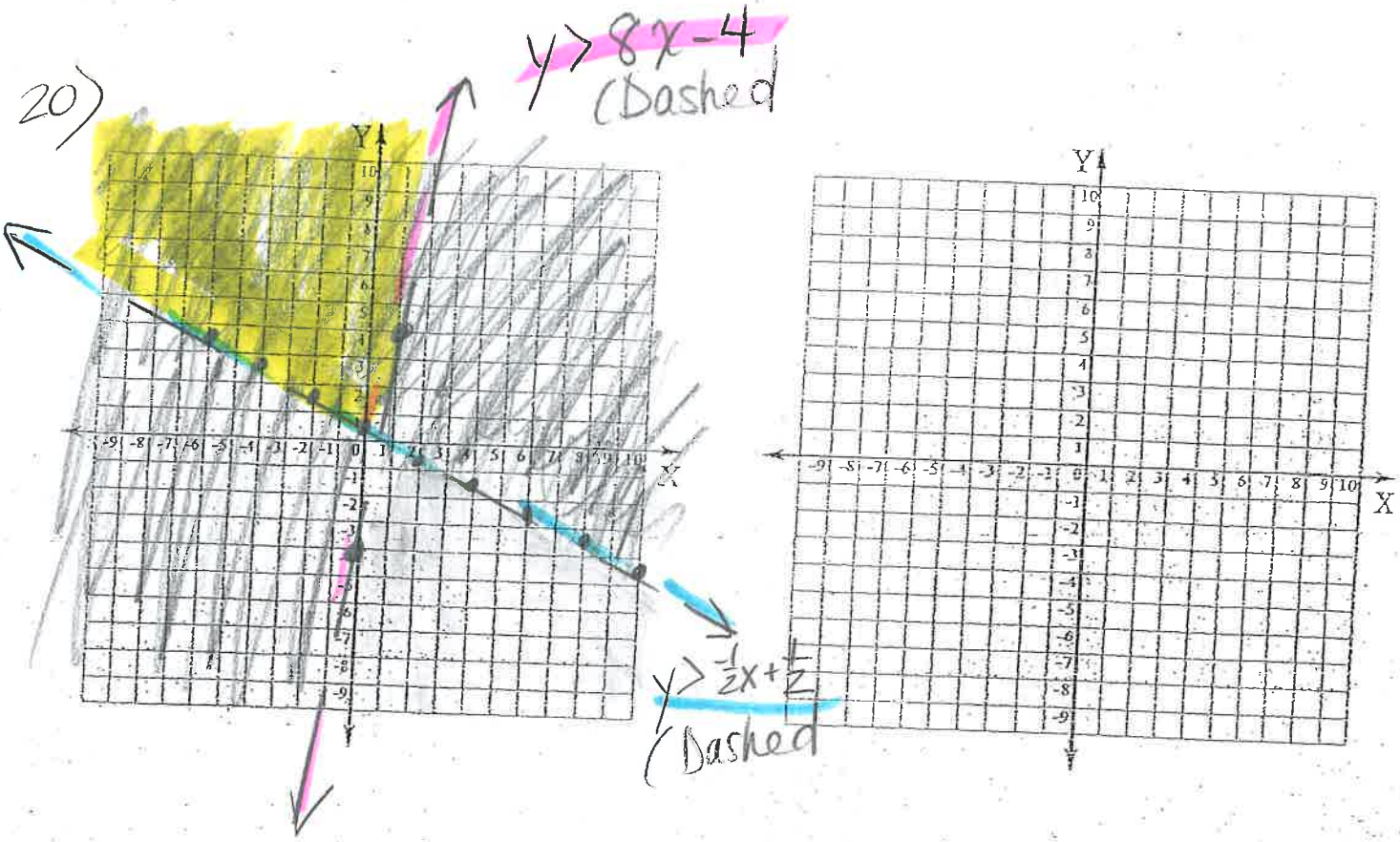
$y \leq -\frac{1}{2}x+5$

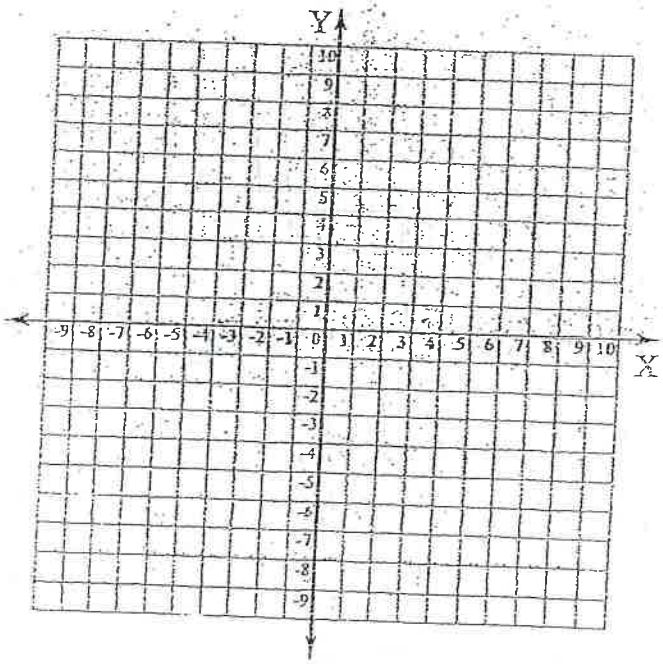
$y \geq -\frac{1}{2}x+\frac{9}{2}$ (solid)

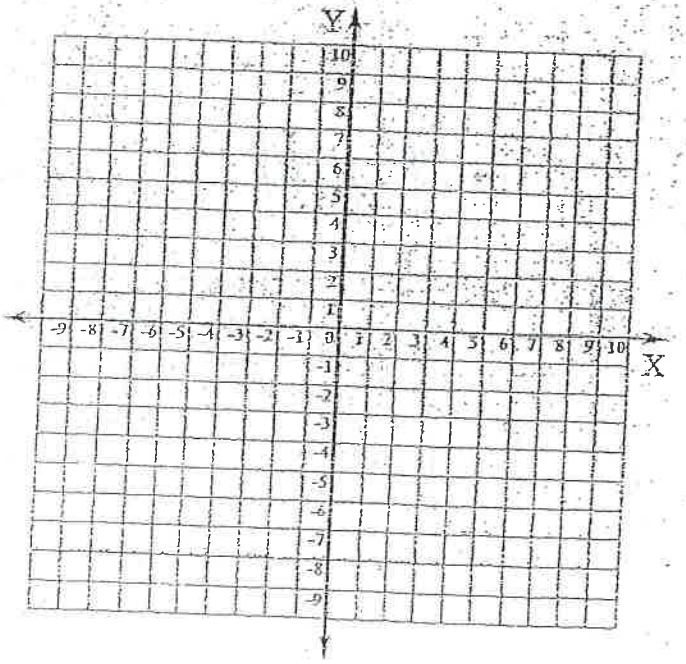
20)

$y > 8x - 4$ (Dashed

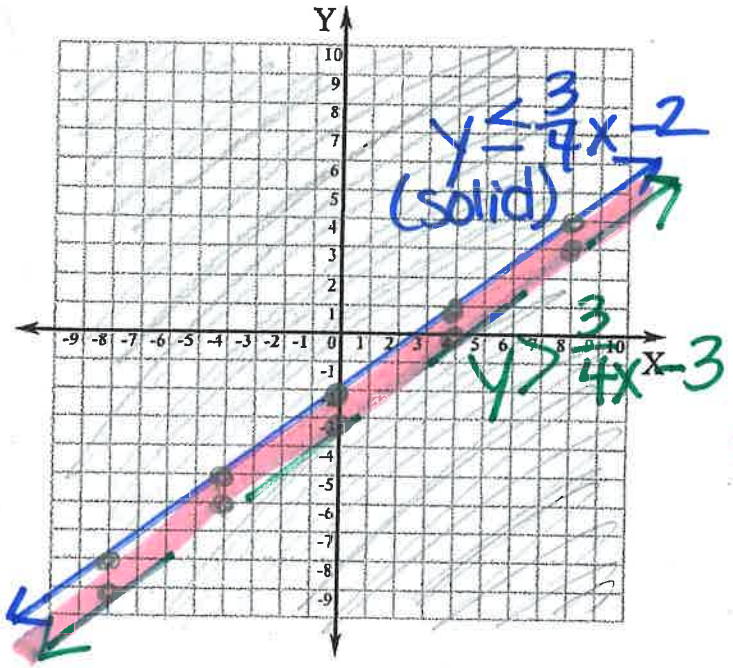
$y > -\frac{1}{2}x + \frac{1}{2}$ (Dashed



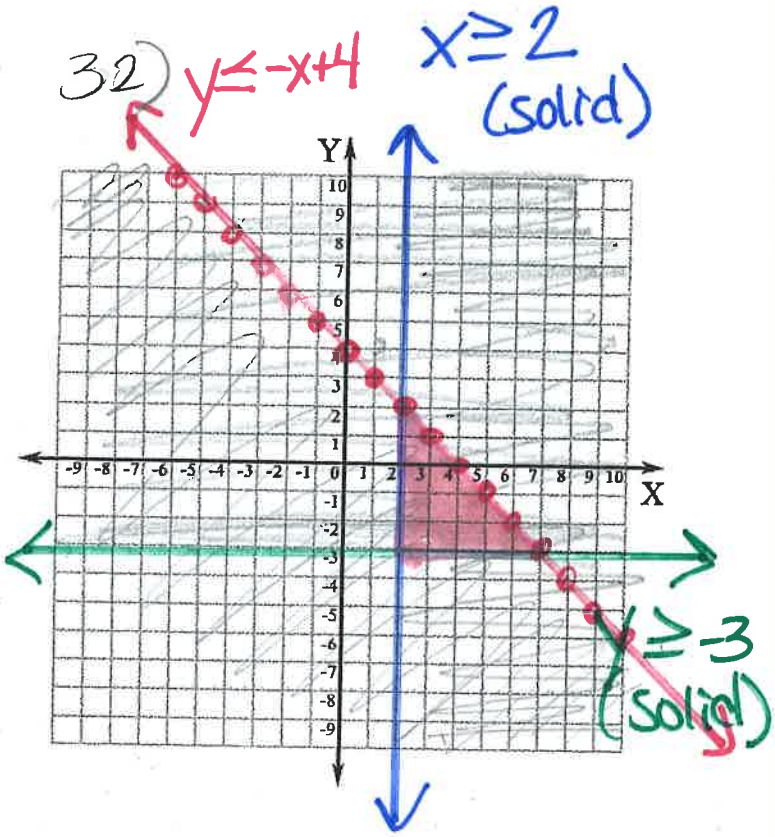


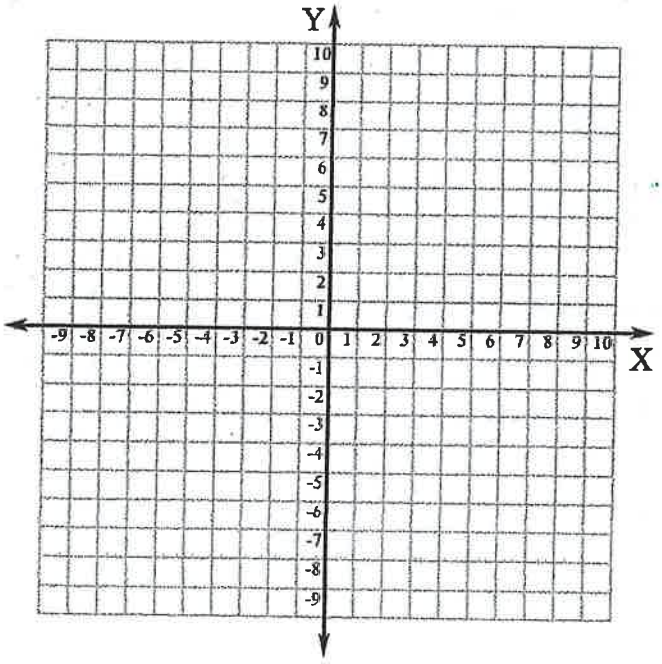


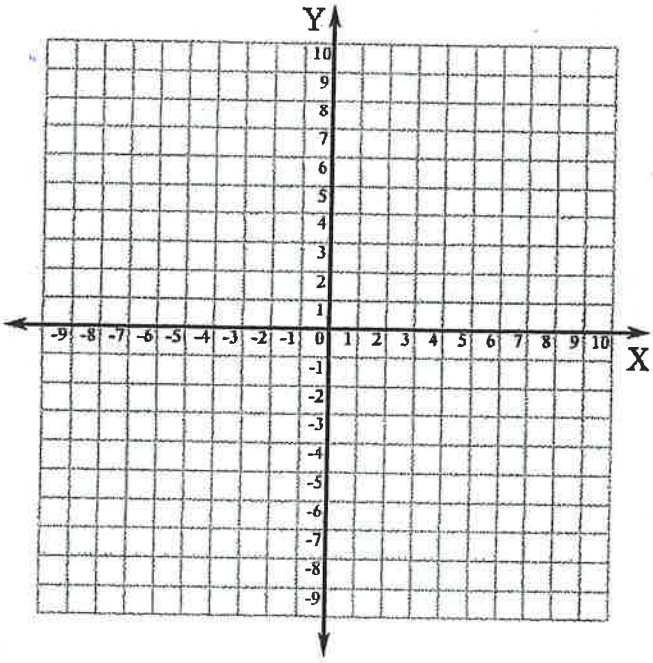
18)


Y
X
$y \leq \frac{3}{4}x - 2$
(solid)
$y > \frac{3}{4}x - 3$

32)


$y \leq -x + 4$
$x \geq 2$
(solid)
Y
X
$y \geq -3$
(solid)


Y
X


Y
X