EAST LOS ANGELES COLLEGE **NAME:** Key

MATHEMATICS 125 TEST CHAPTER 9 --- FALL 2004
INSTRUCTOR: ANNE SISWANTO; TOTAL POINTS: 100; TIME: 70 MINUTES

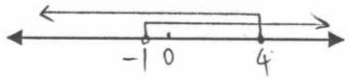
DIRECTION: GRAPHING CALCULATORS ARE NOT ALLOWED. SHOW ALL WORKS ON THE TEST PAPER FOR FULL CREDIT

QUESTION 1 (20 POINTS)
Solve the following compound inequalities, graph the solution set, and state the **Interval Notation**:

a. <7> $3a-7>-10$ *or* $5a+2\le 22$

$3a>-3$ $\quad 5a\le 20$

$a>-1$ or $a\le 4$

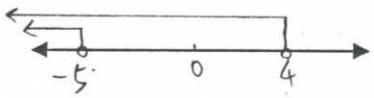


$\therefore$ the solution is $(-\infty,\infty)$

b. <7> $a+4<-1$ *and* $3a-5<7$

$a<-1-4$ $\quad 3a<12$

$a<-5$ and $a<4$

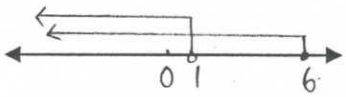


$\therefore$ the solution is $(-\infty,-5)$

c. <6> $2t-7\le 5$ *or* $5-2t>3$

$2t\le 12$ $\quad -2t>-2$

$t\le 6$ or $t<1$



$\therefore$ the solution is $(-\infty, 6]$

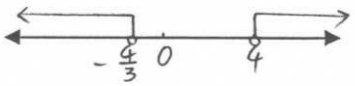
QUESTION 2 (20 POINTS)
Solve the following absolute-value inequalities, graph the solution set, and state the **Interval Notation**:

a. <6> $|3y-4|>8$

$3y-4>8$ or $3y-4<-8$

$3y>12$ $\quad 3y<-4$

$y>4$ or $y<-\frac{4}{3}$



$\therefore$ the solution is $(-\infty,-\frac{4}{3})\cup(4,\infty)$.

b. <7> $12-|x-5|\le 9$

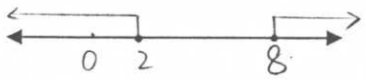
$-|x-5|\le -3$

$|x-5|\ge 3$

$\therefore x-5\ge 3$ or $x-5\le -3$

$x\ge 8$ or $x\le 2$

$\therefore$ the solution is $(-\infty, 2]\cup[8,\infty)$



c. <7> $30-4|a+2|>12$

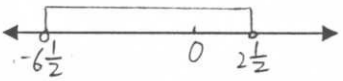
$-4|a+2|>-18$

$|a+2|<\frac{9}{2}$

$\therefore -\frac{9}{2}<a+2<\frac{9}{2}$

$-6\frac{1}{2}<a<2\frac{1}{2}$

$\therefore$ the solution is $(-6\frac{1}{2}, 2\frac{1}{2})$



QUESTION 3 (20 POINTS)

Solve the following absolute-value equations:

a. <6> $|t-7|+1=5$

$|t-7|=4$

$t-7=4$ or $t-7=-4$

$t=11$ or $t=3$

$\therefore$ the solution is $\{3, 11\}$

b. <7> $3|2x-5|-7=-1$

$3|2x-5|=6$

$|2x-5|=2$

$2x-5=2$ or $2x-5=-2$

$x=\frac{7}{2}$ or $x=\frac{3}{2}$

$\therefore$ the solution is $\{\frac{3}{2}, \frac{7}{2}\}$

c. <7> $|x+4|=|x-3|$

$x+4=x-3$ or $x+4=-(x-3)$

$0=-7$

false

$x+4=-x+3$

$2x=-1$

$x=-\frac{1}{2}$

$\therefore$ the solution is $\{-\frac{1}{2}\}$

QUESTION 4 (10 POINTS)
Graph the following inequalities. Label the points:

a. <5> $2y - 3x > 6$

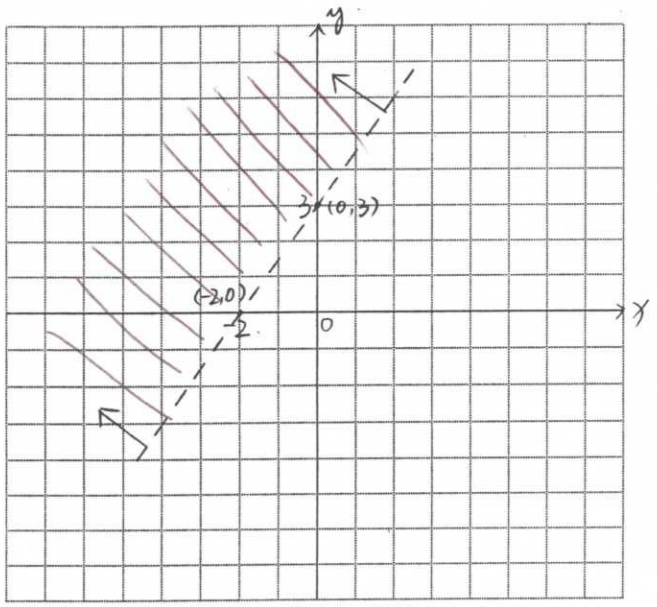
$2y - 3x = 6$

x	y
0	3
-2	0

testpoint (0,0)

$0 - 0 > 6$

$0 > 0$ false



b. <5> $3x - 2 \le 5x + y$

$-2 \le 2x + y$

$2x + y \ge -2$

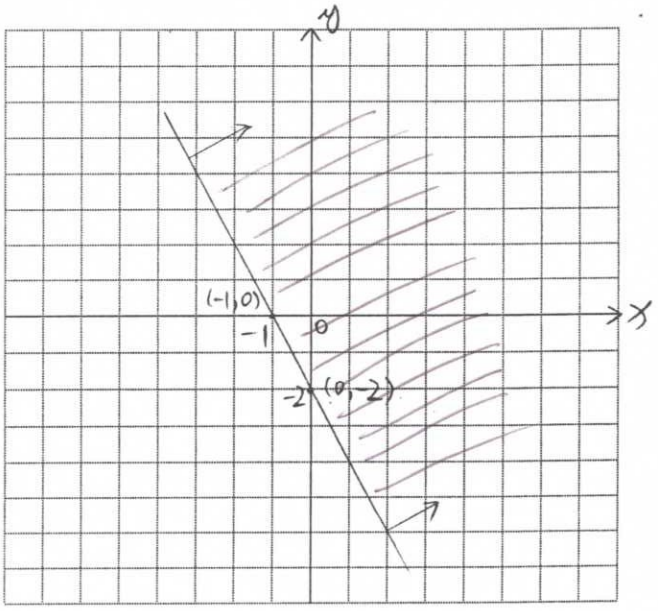
$2x + y = -2$

x	y
0	-2
-1	0

testpoint (0,0)

$0 - 2 \le 0 + 0$

$-2 \le 0$ true



QUESTION 5 (30 POINTS)
Graph the each system of inequalities. Find the coordinates of any vertices formed.

a. <6> $\begin{cases} x + y \le 6 \\ x - y \le 4 \end{cases}$

$x + y = 6$

x	y
0	6
6	0

testpoint (0,0)

$0 + 0 \le 6$

$0 \le 6$ true

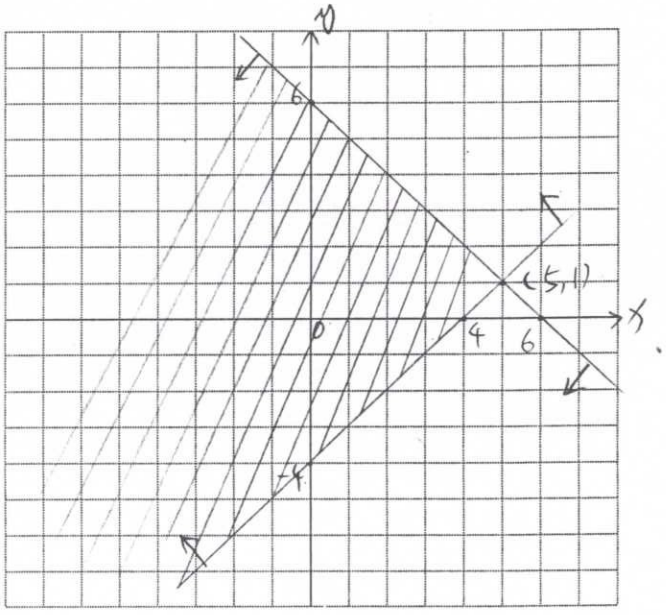
$x - y = 4$

x	y
0	-4
4	0

testpoint (0,0)

$0 - 0 \le 4$

$0 \le 4$ true



b. <12> $\begin{cases} 6x-2y \le 12 \\ y-3 \le 0 \\ x+y \ge 0 \end{cases}$

$6x-2y=12$ testpoint (0,0)

x	y
0	-6
2	0

$0-0 \le 12$

$0 \le 12$ true

$y-3=0$

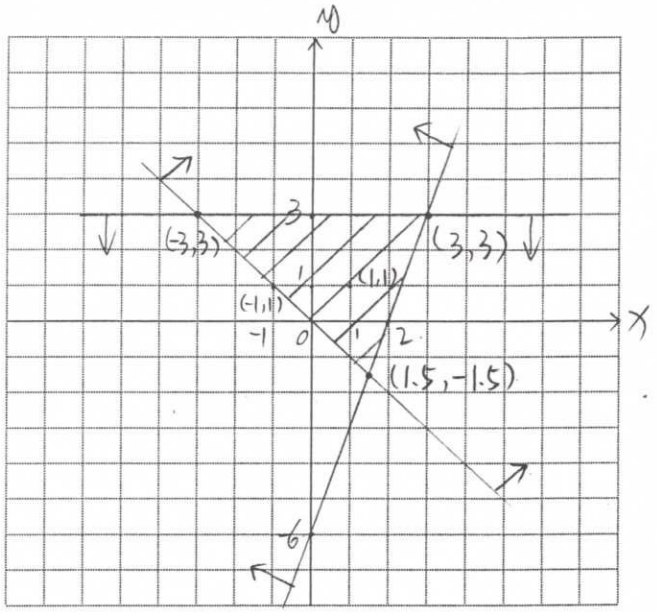
$y=3$.

$x+y=0$ testpoint (1,1)

x	y
0	0
-1	1

$1+1 \ge 0$

$2 \ge 0$ true



c. <12> $\begin{cases} 8x+5y \le 40 \\ x+2y \le 8 \\ x \ge 0 \\ y \ge 0 \end{cases}$

$8x+5y=40$ testpoint (0,0)

x	y
0	8
5	0

$0+0 \le 40$ true

$x+2y=8$ testpoint (0,0)

x	y
0	4
8	0

$0+0 \le 8$

$0 \le 8$ true