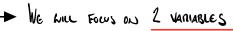
Solve & GRAPH THE SOLVEION SET :



5. Is the point (10, 12) on the line
$$13x - 11y = 2$$
?

6. Is the point
$$(21, 25)$$
 on the line $30x - 27y = 12$

8. Is the point
$$(21, 25)$$
 in the solution set of $30x - 27y \le 1$?

MORE GENERALLY:

A Graph each inequality in Problems 9-18.

9.
$$y \le x - 1$$

10.
$$y > x + 1$$

11.
$$3x - 2y > 6$$

12.
$$2x - 5y \le 10$$

13.
$$x \ge -4$$

14.
$$y < 5$$

15.
$$6x + 4y \ge 24$$

16.
$$4x + 8y \ge 32$$

17.
$$5x \le -2y$$

18.
$$6x \ge 4y$$

In Problems 19-22,

(A) graph the set of points that satisfy the inequality.

(B) graph the set of points that do not satisfy the inequality.

19.
$$2x + 3y < 18$$

20.
$$3x + 4y > 24$$

21.
$$5x - 2y \ge 20$$

22.
$$3x - 5y \le 30$$

THEOREM 1 Graphs of Linear Inequalities

The graph of the linear inequality

$$Ax + By < C$$
 or $Ax + By > C$

with $B \neq 0$, is either the upper half-plane or the lower half-plane (but not both) determined by the line Ax + By = C.

If
$$B = 0$$
 and $A \neq 0$, the graph of

$$Ax < C$$
 or $Ax > C$

is either the left half-plane or the right half-plane (but not both) determined by the

PROCEDURE Graphing Linear Inequalities

- Step 1 First graph Ax + By = C as a dashed line if equality is not included in the original statement, or as a solid line if equality is included.
- Step 2 Choose a test point anywhere in the plane not on the line [the origin (0,0) usually requires the least computation], and substitute the coordinates into the inequality.
- Step 3 Does the test point satisfy the original inequality? If so, shade the halfplane that contains the test point. If not, shade the opposite half-plane.

GIVEN 2 POINTS A (1,5) & B (7,3), WHICH POINTS IN THE PLANE ARE CLOSER TO A THAN B?

- **65.** Mattresses. A company produces foam mattresses in two sizes: regular and king. It takes 5 minutes to cut the foam for a regular mattress and 6 minutes for a king mattress. If the cutting department has 50 labor-hours available each day, how many regular and king mattresses can be cut in one day?
- **63.** Political advertising. A candidate has budgeted \$10,000 to spend on radio and television advertising. A radio ad costs \$200 per 30-second spot, and a television ad costs \$800 per 30-second spot. How many radio and television spots can the candidate purchase without exceeding the budget?
- 57. Fertilizer. A farmer wants to use two brands of fertilizer for his corn crop. Brand A contains 26% nitrogen, 3% phosphate, and 3% potash. Brand B contains 16% nitrogen, 8% phosphate, and 8% potash.

(Source: Spectrum Analytic, Inc.)

- (A) How many pounds of each brand of fertilizer should he add to each acre if he wants to add at least 120 pounds of nitrogen to each acre?
- (B) How many pounds of each brand of fertilizer should he add to each acre if he wants to add at most 28 pounds of phosphate to each acre?