

ALG & NT. EXERCISES

$x > 6$  

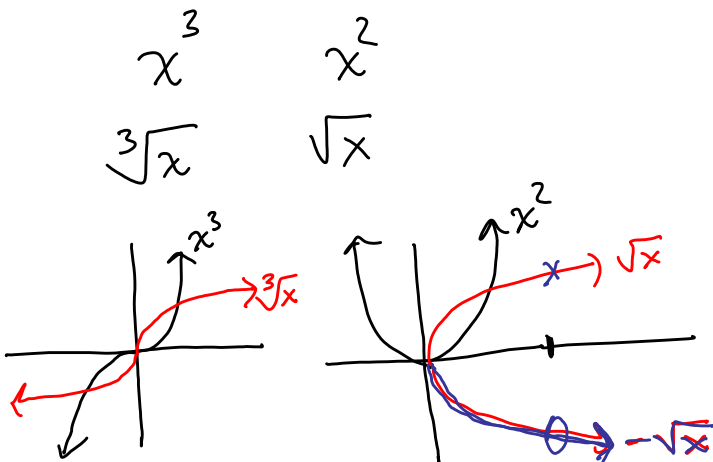
6
 $(6, \infty)$

c)  $(-\infty, -7) \cup (6, \infty)$

b)  $(-7, 6)$

$-1 = \sqrt{x} \leftarrow$ HAS NO SOL'NS IN $\mathbb{R}$.

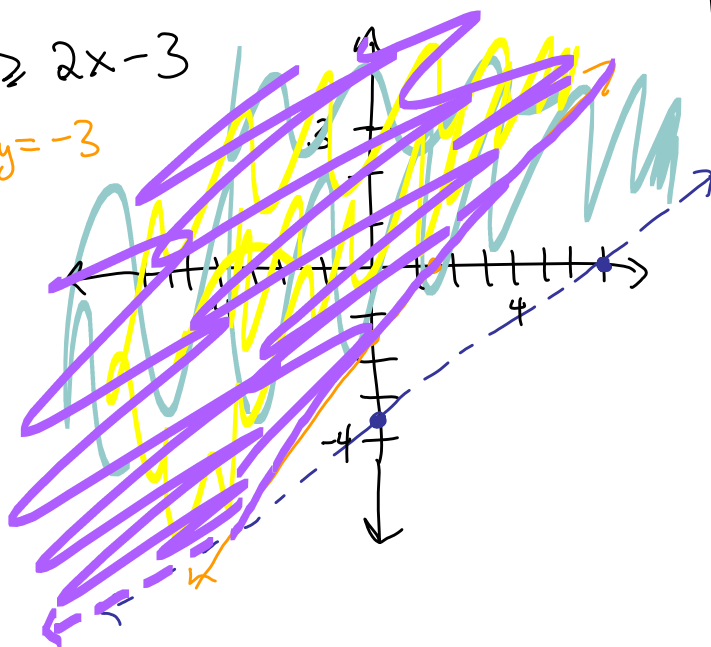
$1 = x$ ← HAS A SOL'N: 1.



GRAPHING INEQUALITIES

- $x - 2y < 7 \rightarrow x - 2y = 7$

- $2y \geq 2x - 3$
 $-2x + 2y = -3$



① GRAPH THE LINE

② TEST A POINT NOT ON LINE
 $(0,0), (0,1), (1,0)$

IF INEQ IS TRUE
 SHADE THE SIDE
 CONTAINING THE
 TEST POINT.
 OTHERWISE SHADE
 THE OTHER SIDE.

LINEAR PROGRAMMING PROBLEMS

MAXIMIZE $3x - 2y$ $\begin{cases} -3x + 2y \end{cases}$

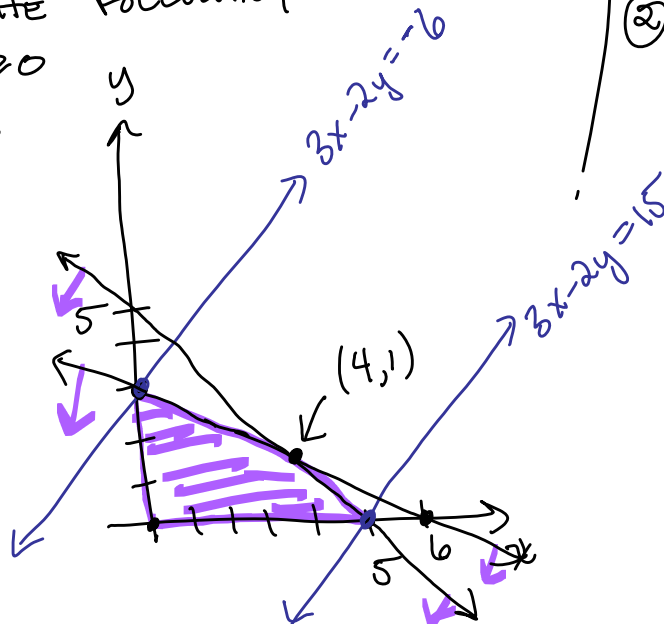
SUBJECT TO THE FOLLOWING CONSTRAINTS

$$x \geq 0 \quad y \geq 0$$

$$x + y \leq 5$$

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

CP	$3x - 2y$
$(0,0)$	0
$(5,0)$	15 $\leftarrow$ MAX
$(0,3)$	-6
$(4,1)$	10



① GRAPH THE FEASIBLE REGION.

② FIND CORNER POINTS

$$3x - 2y = c$$

Solve

$$x + y = 5$$

$$- (\frac{1}{2}x + y = 3)$$

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

$$x = 4, y = 1$$

$$Ax + By = C$$

$$m = -\frac{A}{B}$$

$$b = \frac{C}{B}$$

#3

Let x BE THE NUMBER OF REGULAR ARRANGEMENTS.
Let y " " " " DELUXE " "

MAXIMIZE PROFIT : PROFIT IS GIVEN BY
 $5.5x + 7.5y$

CARNATIONS:

$$2x + 4y \leq 160$$

ROSES :

$$x + 2y \leq 90$$

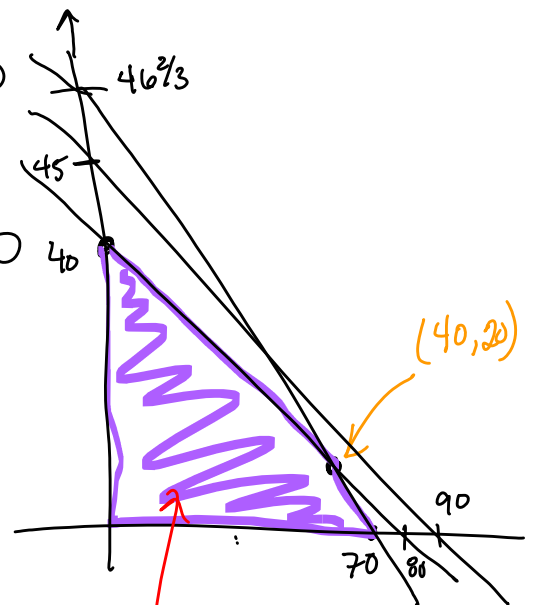
TULIPS :

$$2x + 3y \leq 140$$

$$x, y \geq 0$$

CP	$5.5x + 7.5y$
(0, 40)	300
(70, 0)	385
(0, 0)	0
(40, 20)	370

MAX.



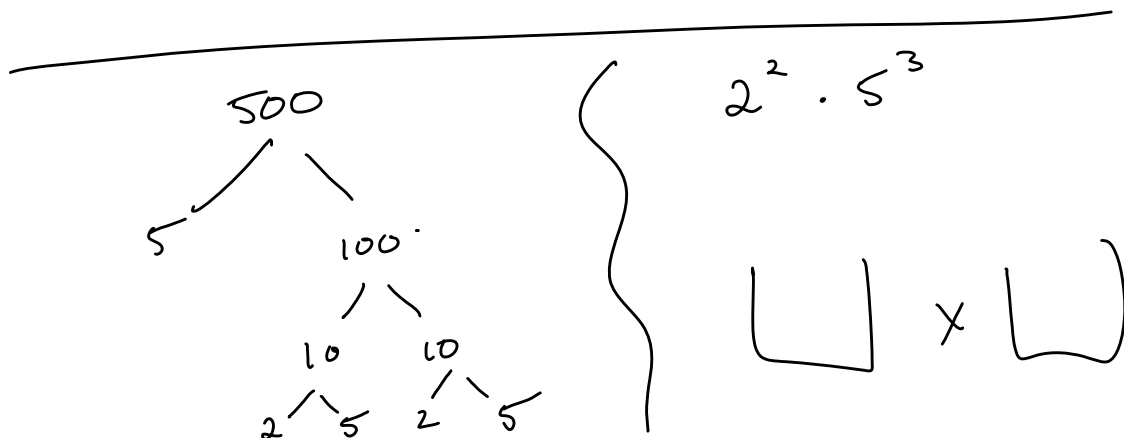
SHADED REGION
INDICATES FEASIBLE SOLNS

SHE SHOULD MAKE 70 REGULAR ARRANGEMENTS
AND NO DELUXE ONES TO MAXIMIZE PROFIT.
SHE'LL MAKE \$385.

THE FUNDAMENTAL THEOREM OF ARITHMETIC

EVERY NATURAL NUMBER ≥ 2 MAY BE FACTOR
INTO PRIMES IN A UNIQUE WAY (UP TO THE ORDER
OF THE FACTORS).

ex: $40 = 2 \times 2 \times 2 \times 5$
 $2 \times 2 \times 5 \times 2$
 $2 \times 5 \times 2 \times 2$
 $5 \times 2 \times 2 \times 2$



$$2 \quad \times \quad 2 \times 5^3$$

$$2^2 \quad \times \quad 5^3$$

$$5 \quad \times \quad 2^2 \times 5^2$$

$$5^2 \quad \times \quad 2^2 \times 5$$

$$5^3 \quad \times \quad 2^2$$

$$2 \times 5 \quad \times \quad 2 \times 5^2$$

$$2^2 \times 5 \quad \times \quad 5^2$$