7) A small computer company makes two popular models of computers. Both models take 1 hour assemble. However, model A requires 7.5 minutes to test where model B requires 30 minutes to test. With the company's current facilities, there are 45,000 hours per month available for assembly, and 15,000 hours per month available for testing. The profit for model A is $ 50 per unit, and the profit for model B is $ 80 per unit. What is the greatest monthly profit the company can make without increasing its facilities?

Let x = # of model A computers
Let y = # of model B computers

Objective function

profit $= 50x + 80y$

Keep everything in the same unit – either minutes or hours

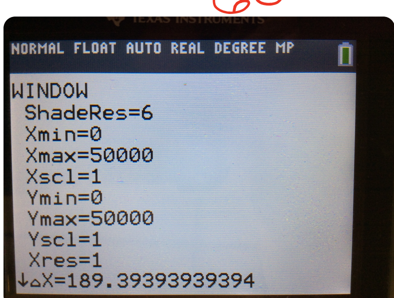
Constraints

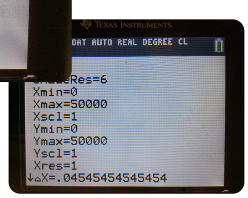
$$x + y \le 45{,}000 \quad \text{Hours}$$

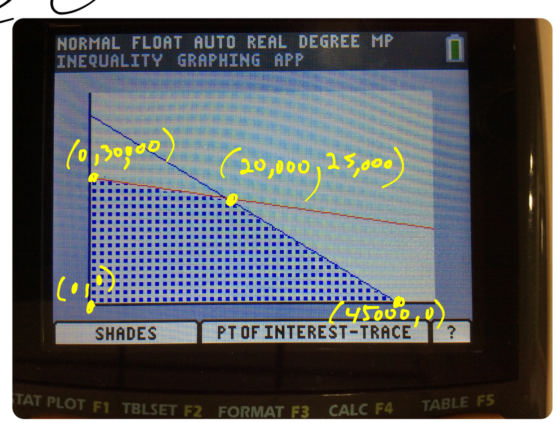
$$\frac{7.5}{60}x + \frac{30}{60}y \le 15{,}000 \quad \text{Hours}$$

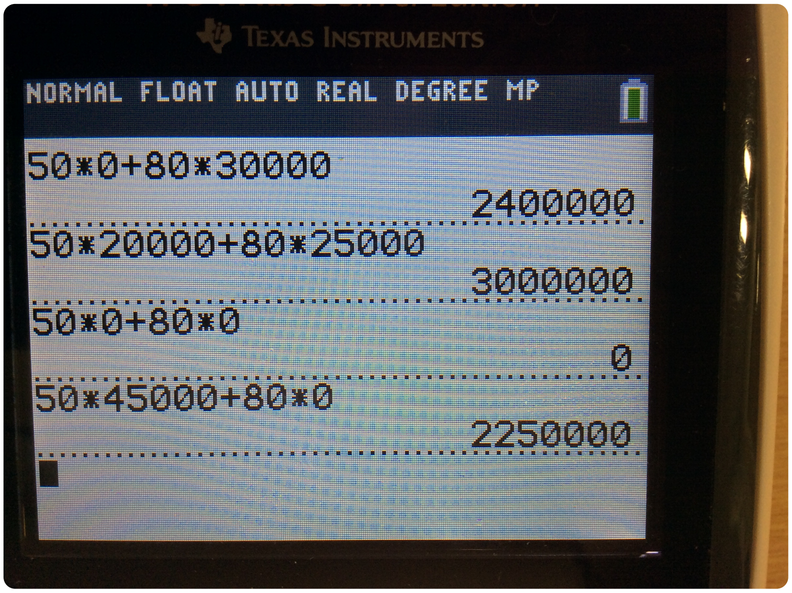
$$x \ge 0$$

$$y \ge 0$$









20,000
MODEL A
&
25,000
MODEL B

8) A manufacturer produces two types of fishing rods. Rod DC4 requires 2 ½ hours to cut, 2 hrs to finish, and 45 minutes to ship. Rod KL3 requires 3 hrs to cut, 1 hr to finish, and 1hr. 15 minutes to ship. The total time available for cutting, finishing, and shipping is 4,000 hrs, 2,500 hrs and 1,500 hrs respectively. How many units of each type should be produced to achieve maximum profit if the profit on model DC4 is $ 225 and the profit on model KL3 is $ 175 ?

Let x = # of DC4
Let y = # of KL3

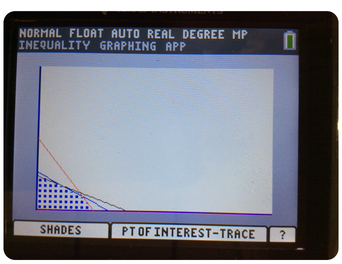
45 mins = .75 HR
1 Hr 15 min = 1.25 HR

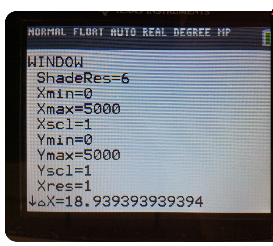
Objective Function

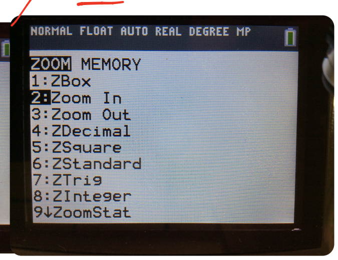
profit = 225x + 175y

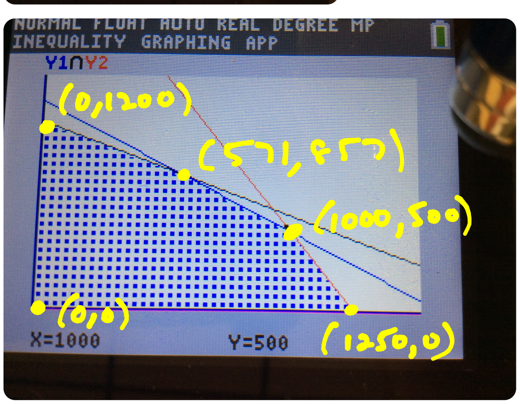
Constraints

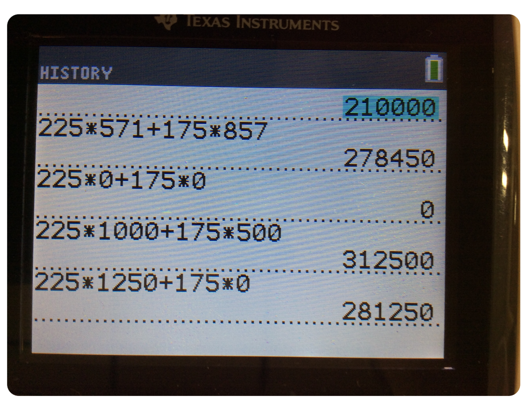
$2.5x + 3x \le 4000$ ← cut
$2x + 1y \le 2500$ ← finish
$.75x + 1.25y \le 1500$ ← ship
$x \ge 0$
$y \ge 0$











1000 model DC4 & 500 model KL3

9) **A calculator company produces a scientific calculator and a graphing calculator. Long-term projections indicate an expected demand of at least 100 scientific and 80 graphing calculators each day. Because of limitations on production capacity, no more than 200scientific and 170 graphing calculators can be made daily. To satisfy a shipping contract, a total of at least 200 calculators much be shipped each day. If each scientific calculator sold results in a $2 loss, but each graphing calculator produces a $5 profit, how many of each type should be made daily to maximize net profits?**

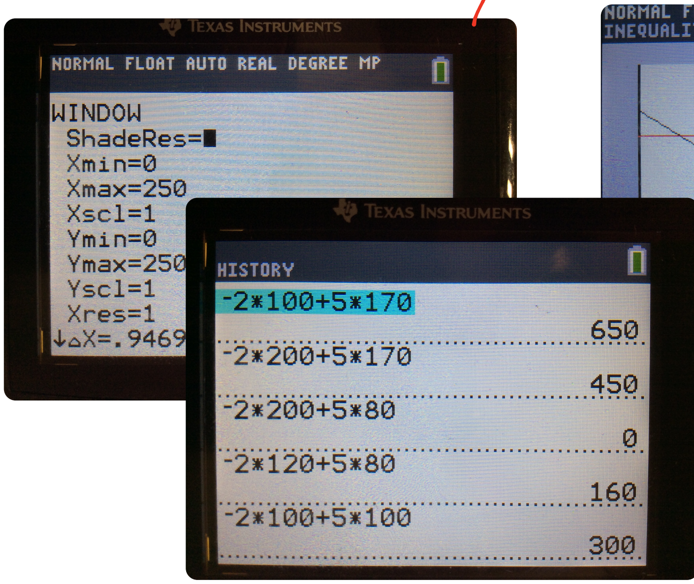
Let x = # of scientific calcs
Let y = # of graphing calcs

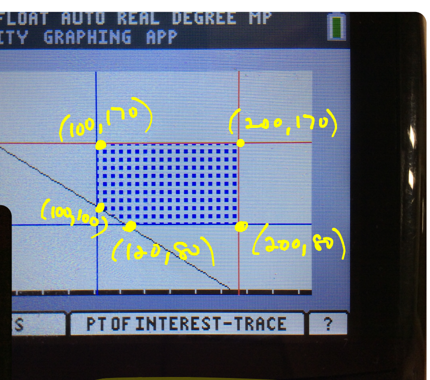
Objective Function

profit $= -2x + 5y$

Constraints

$x \geq 100$
$y \geq 80$
$x \leq 200$
$y \leq 170$
$x + y \geq 200$





100 scientific & 170 graphing calculators