

1. The area of a parking lot is 600 square meters. A car requires 6 square meters. A bus requires 30 square meters. The attendant can handle only 60 vehicles. If a car is charged \$2.50 and a bus \$7.50, how many of each should be accepted to maximize income?

	Car, x	Bus, y	Total
Area, m^2	$6x$	$+ 30y$	≤ 600
No. Veh.	$1x$	$+ 1y$	≤ 60
Income \$	$2.50x$	$7.50y$	MAX

$$I = 2.5x + 7.5y$$

$$6x + 30y \leq 600$$

$$x + y \leq 60$$

$$x \geq 0, y \geq 0$$

$$x = 60, y = 60$$

$$\frac{6x = 600}{6} \quad \frac{600}{6}$$

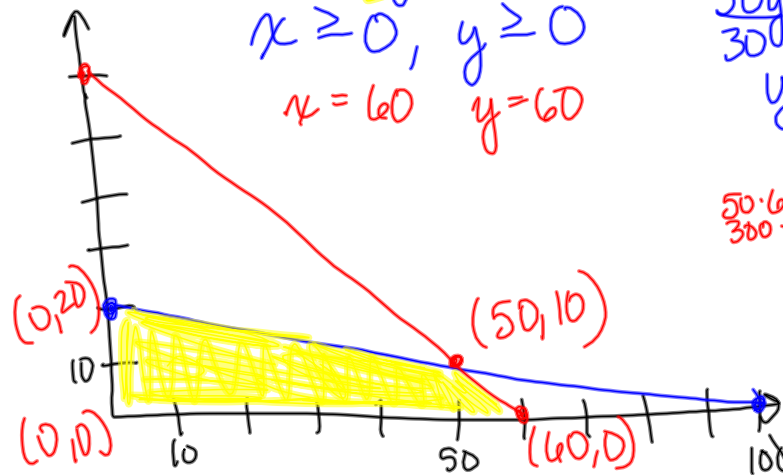
$$x = 100$$

$$\frac{30y = 600}{30} \quad \frac{600}{30}$$

$$y = 20$$

$$50 \cdot 6 + 30 \cdot 10 = 600$$

$$300 + 300 = 600$$



$$I(0,0) = 2.5 \cdot 0 + 7.5 \cdot 0 = 0 \quad I(x,y) = 2.5x + 7.5y$$

$$I(0,20) = 2.5 \cdot 0 + 7.5(20) = 150$$

$$I(50,10) = 2.5(50) + 7.5(10) = 125 + 75 = 200$$

$$I(60,0) = 2.5(60) + 7.5(0) = 150$$

50 Cars
10 Buses

The B & W Leather Company wants to add handmade belts and wallets to its product line. Each belt nets the company \$18 in profit, and each wallet nets \$12. Both belts and wallets require cutting and sewing. Belts require 2 hours of cutting time and 6 hours of sewing time. Wallets require 3 hours of cutting time and 3 hours of sewing time. If the cutting machine is available 12 hours a week and the sewing machine is available 18 hours per week, what ratio of belts and wallets will produce the most profit within the constraints?

	Belts, x	Wallets, y	Total
Cut. hr	$2x$	$+ 3y$	≤ 12
Sew hr	$6x$	$+ 3y$	≤ 18
Profit \$	$18x$	$+ 12y$	MAX

OF

$$-3(2x + 3y \leq 12) \quad P = 18x + 12y$$

$$6x + 3y \leq 18$$

$$x \geq 0, y \geq 0$$

$$\frac{2x}{2} = \frac{12}{2} \quad \frac{3y}{3} = \frac{12}{3}$$

$$x = 6 \quad y = 4$$

$$-6x - 9y = -36$$

$$\frac{6x + 3y = 18}{-6x - 9y = -36}$$

$$-6y = -18$$

$$y = 3$$

$$\frac{6x}{6} = \frac{18}{6} \quad \frac{3y}{3} = \frac{18}{3}$$

$$x = 3 \quad y = 6$$

