Pre-Calculus Name_____

Chapter 7 Review

Solve each system of equations.

1. $x + y = 5$
   $x - y = -1$

(2, 3)

2. $2x - 3y = -16$
   $x - y = -5$

(1, 6)

3. $x^2 - y^2 = 16$
   $x - y = 2$

$x = 2 + y$

$(y+2)^2 - y^2 = 16$

$y^2 + 4y + 4 - y^2 = 16$

$4y + 4 = 16$

$4y = 12$

$y = 3$

(5, 3)

4. $x = y$
   $x = y^2 - 6$

(3, 3) or (-2, -2)

5. $x - 7y + 8z = -23$
   $y - 9z = -11$
   $z = 2$

$y - 18 = -11$

$y = 7$

$x - 49 + 16 = -23$

(10, 7, 2)

6. $2x + y - 3z = -7$

$-2(x - y + 2z = 3)$

$2(x - 2y - z = 2)$

$-2x + 2y - 4z = -6$

$-2x + 4y + 2z = -4$

$3y - 7z = -13$

$5y - z = 11$

$15y - 35z = -65$

$-15y + 3z = 33$

$-32z = -32$

$z = 1$

$5y - 1 = -11$

$5y = -10$

(-1, -2, 1)

7. All 26 members in Papillion-LaVista's Snow Club went on a one-day trip. Members can rent skis for $18 per day or snowboards for $24 per day. The club paid a total of $552 for rental equipment. How many rented skis and how many rented snowboards?

x = Ski y = snowboard

$18x + 24y = 552$

$x + y = 26$

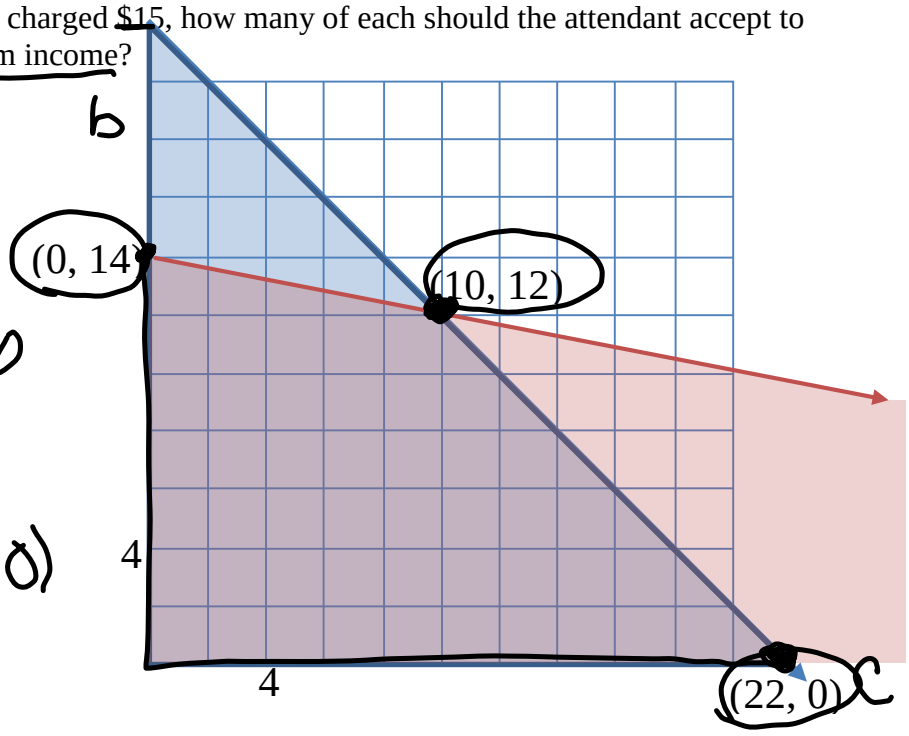
Snowboards rented 14
Skis rented 12

8. In the 2000-2001 season, Minnesota's Katie Smith was ranked first in the WNBA for total points and three-point field goals made. She scored 352 points making 227 shots, including 3-pointers, 2-point baskets, and free throws (1 point each). She made 3 times as many 2-point baskets as 3-pointers. Find the number of each type of basket she made.

2 point field goals 75
3 point field goals 25
Free throws 127

9. The available parking area of a parking lot is 350 square meters. A car requires 5 square meters of space, and a bus requires 25 square meters of space. The attendant can handle no more than 22 vehicles. If a car is charged $8 to park and a bus is charged $15, how many of each should the attendant accept to maximize income? What is the maximum income?

Constraints: 1) $5c + 25b \leq 350$
2) $c + b \leq 22$
3) $c \geq 0$
4) $b \geq 0$
Objective fn: Z = $8c + 15b$



(0,14) $5c + 25b \leq 350$
(10,0) $c + b \leq 22$
(0,22) (22,0)
$5(-b+22) + 25b \leq 350$
$-5b + 110 + 25b \leq 350$

Optimal # Cars 10
Optimal # Busses 12
Maximum Income $260

x = indoor shoes y = outdoor

10. A shoe manufacturer makes outdoor and indoor soccer shoes. There is a two-step process for both kinds of shoes. Each pair of outdoor shoes requires 1.5 hours in step one, 2 hour in step two, and produces a profit of $30. Each pair of indoor shoes requires 3 hour in step one, 1 hours in step two, and produces a profit of $15. The company has 48 hours of labor per day available for step one and 40 hours available for step 2. What combination of shoes will maximize the profit for the manufacturer? What is the maximum profit?

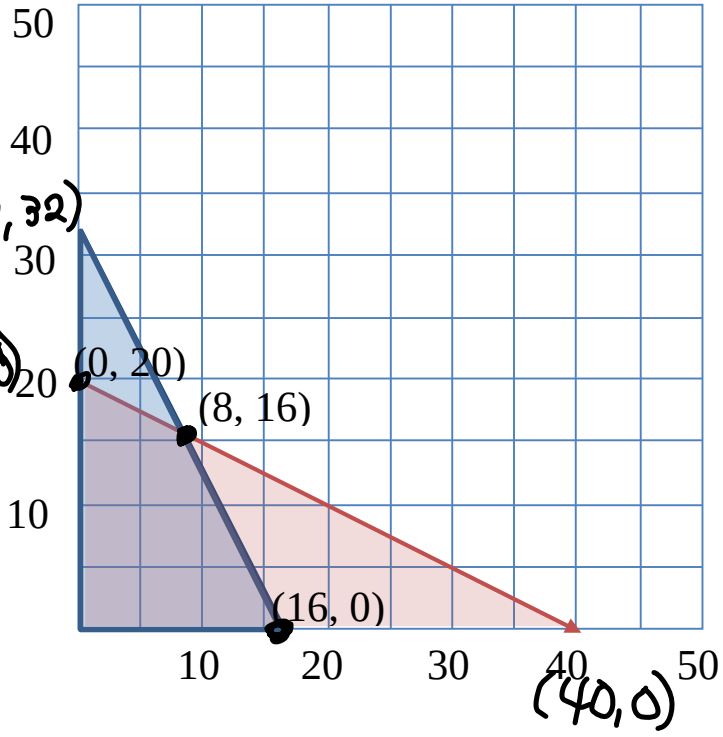
Constraints: 1) $3x + 1.5y \leq 48$
2) $x + 2y \leq 40$
3) $x \geq 0$
4) $y \geq 0$
Objective fn: Z = $15x + 30y$

step 1
step 2

$3x + 1.5y = 48$
$-3x - 6y = -120$
$-4.5y = -72$
$\frac{-4.5y}{-4.5} = \frac{-72}{-4.5}$
$y = 16$

$x + 32 = 40$
$x = 8$

(0, 32)
(0, 20)
(8, 16)
(16, 0)
(40, 0)



max
$15x + 30y$

(0, 20) $0 + 30(20)$
600

(8, 16) $15(8) + 30(16)$
600

(16, 0) $15(16) + 30(0)$
240

Optimal # outdoor shoes 16 or 20
Optimal # indoor shoes 18 or 0
Maximum profit $600