PC Review
Chapter 7

Name: Key

Hour: _____

Solve each system of equations. Be sure to write your answers as ordered pairs. Even if it has infinite solutions must express them in ordered pair form.

1. $\begin{cases} 2x^2 + 5y = 2 \\ 3x^2 + 4y = 17 \end{cases}$

$-6x^2 - 15y = -6$
$6x^2 + 8y = 34$
$-7y = 28$
$y = -4$

$2x^2 + 5(-4) = 2$
$2x^2 = 22$
$x^2 = 11$
$x = \pm\sqrt{11}$

$(+\sqrt{11}, -4)$
$(-\sqrt{11}, -4)$

2. $\begin{cases} x^2 + y^2 = 5 \\ 3x - y = 5 \end{cases}$

$y = 3x - 5$
$x^2 + (3x-5)^2 = 5$
$x^2 + (3x-5)(3x-5) = 5$
$x^2 + 9x^2 - 30x + 25 = 5$
$-5 \quad -5$
$x^2 - 30x + 20 = 0$

$10x^2 - 30x + 20 = 0$
$10(x^2 - 3x + 2) = 0$
$10(x-2)(x-1) = 0$
$x = 2 \quad x = 1$

$3(2) - y = 5$ $\quad$ $3(1) - y = 5$
$6 - y = 5$ $\quad$ $3 - y = 5$
$y = 1$ $\quad$ $y = -2$

$(2, 1)$ $\quad$ $(1, -2)$

3. A customer in coffee shop purchases a blend of two coffees: Kenyan, costing \$3.50 a pound, and Sri Lankan, costing \$5.60 a pound. He buys 3 pounds of the blend, which costs him 11.55. How many pounds of each type did he buy?

$x \to$ lbs of Kenyan Coffee
$y \to$ lbs of Lankan coffee

$x + y = 3$
$3.5x + 5.6y = 11.55$

$x = 3 - y$
$3.5(3-y) + 5.6y = 11.55$
$10.5 - 3.5y + 5.6y = 11.55$
$-10.5 \quad -10.5$
$2.1y = 1.05$
$y = 0.5 \quad x = 2.5$

2.5 lbs of Kenyan & 0.5 lbs of Lankan

4. A certain brand of razor blades comes in packages of 6, 12, and 24 blades, costing \$2, \$3, and \$4 per package, respectively. A store sold 12 packages containing a total of 162 razor blades and took in \$35. How many packages of each type were sold?

$x \to$ 6 blade pack
$y \to$ 12 blade pack
$z = 24$ blade pack

A $6x + 12y + 24z = 162$
B $2x + 3y + 4z = 35$
C $x + y + z = 12$

(C) $-6(x + y + z = 12)$
(A) $6x + 12y + 24z = 162$
$-6x + 6y + 6z = -72$
(D) $6y + 18z = 90$

(C) $-2(x + y + z = 12)$
(B) $2x + 3y + 4z = 35$
$-2x - 2y - 2z = -24$
(E) $y + 2z = 11$ -6
(D) $6y + 18z = 90$
$-6y - 12z = -66$
$\frac{6z}{6} = \frac{24}{6}$
$z = 4$

$y + 2(4) = 11$
$y + 8 = 11$
$y = 3$
$x + 3 + 4 = 12$
$x + 7 = 12$
$x = 5$

$(5, 3, 4)$

5. $\begin{cases} (x-2)^2 + (y+3)^2 < 4 \\ y \geq x^2 - 4 \end{cases}$ ← Center $(2, -3)$
$r = 2$

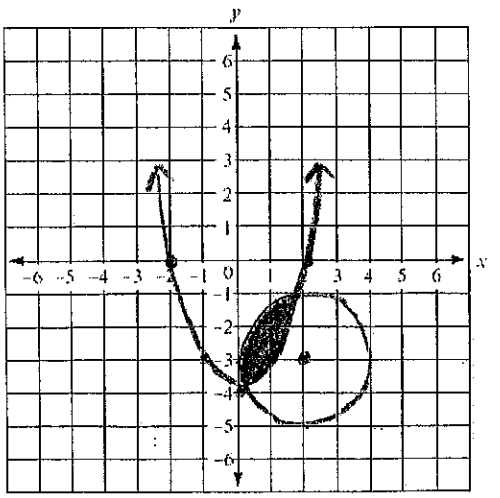
x	y
-2	0
-1	-3
0	-4
1	-3
2	0

Plug in $(2, -3)$
$(2-2)^2 + (-3+3)^2 < 4$
$0^2 + 0^2 < 4$ ✓

* Inside the Circle

Plug in $(0, 0)$
$0 \geq 0^2 - 4$
$0 \geq -4$ ✓

* Inside the parabola



6. Graph the feasible region.

$$\begin{cases} x \geq 0 \\ y \geq -1 \\ y \leq x+1 \\ y \leq -\frac{1}{4}x+6 \end{cases}$$

To find that point off the graph to the right...

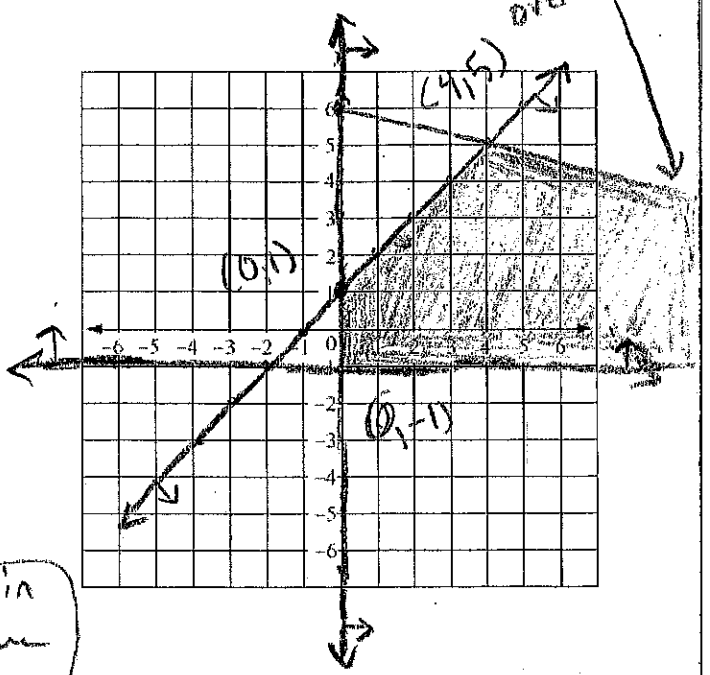
plug $y=-1$ into $y=-\frac{1}{4}x+6$

$-1 = -\frac{1}{4}x+6$
$-6 \qquad -6$

$-4 \cdot -7 = -\frac{1}{4}x \cdot -4$

$28 = x$ so $(28,-1)$

technically there is a point over there



7. Minimize $P = 3x + 5y$

$(0,-1)$ $P = 3(0)+5(-1) = -5$

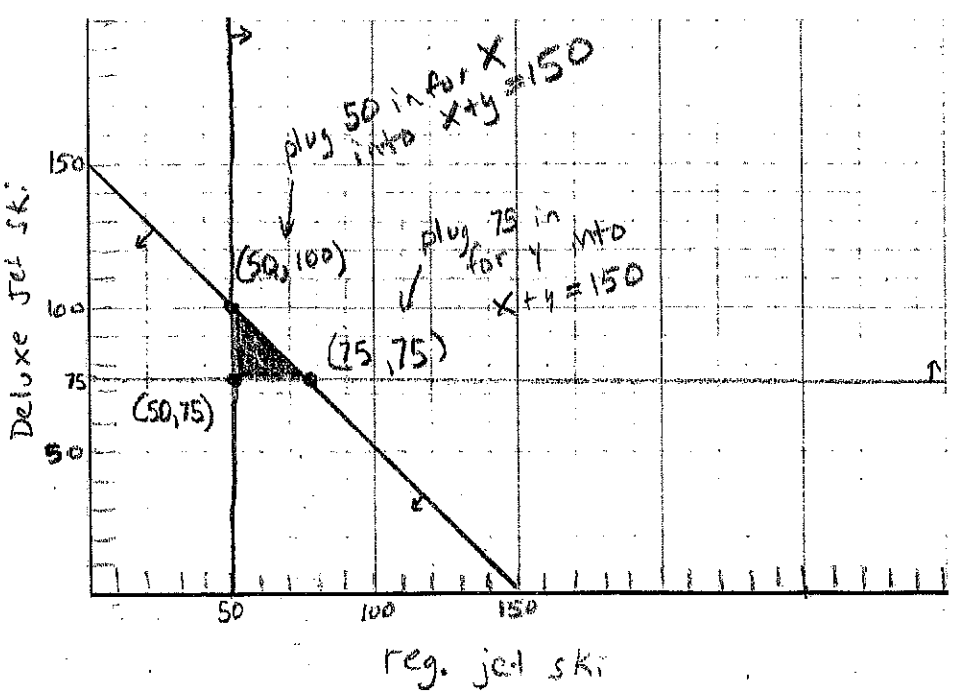
$(0,1)$ $P = 3(0)+5(1) = 5$

$(4,5)$ $P = 3(4)+5(5) = 37$

$(28,-1)$ $P = 3(28)+5(-1) = 79$

$P=-5$ is the min to get that value $x=0$ & $y=-1$

8. A manufacturer makes two types of jet skis, regular and deluxe. The profit on a regular jet ski is \$200 and profit on the deluxe model is \$250. To meet customer demand, the company must manufacture at least 50 regular jet skis per week and at least 75 deluxe models. To maintain high quality, the total number of both models of jet skis manufactured by the company should not exceed 150 per week. How many jet skis of each type should be manufactured per week to obtain maximum profit? What is the maximum weekly profit? Be sure to show ALL work and equations/inequalities. $Z = 200x + 250y$



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

$x \geq 50$
$y \geq 75$
$x + y \leq 150$

$(50,75) \rightarrow Z = 200(50)+250(75)$
$Z = \$28{,}750$

$(50,100) \rightarrow Z = 200(50)+250(100)$
$Z = \$35{,}000$

$(75,75) \rightarrow Z = 200(75)+250(75)$
$Z = \$33{,}750$

Max weekly profit is \$35,000 which was 50 regular & 75 deluxe jet skis.