Week in Review #4
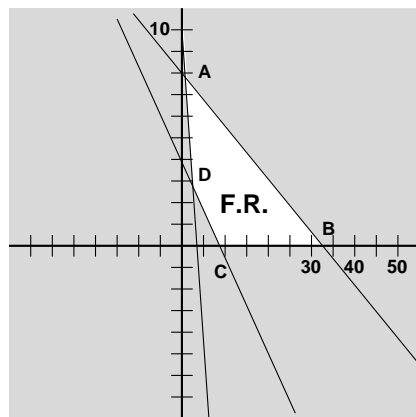
1. $x + y > 20$
   $x + 2y \geq 24$
   $3x - 2y > 0$

2. The corner points are labeled in the picture.

c.p.	$F = 4x + 2y$
$A\left(\frac{8}{9}, \frac{70}{9}\right)$	$\frac{172}{9} \approx 19.1111$
$B(32, 0)$	128
$C(8, 0)$	32
$D(3, 2.5)$	17

The maximum value of F is 128 and occurs at point B.

3. Corner points are D, E, and F. Since the region is unbounded create two imaginary corner points: L(0,20) and K(10,7).

c.p.	D	E	F	L	K
f	15	15	18	20	27

min value of 15
location of minimum: point D and E and all points between them on a straight line. ie. $\overline{DE}$ or $\overline{ED}$

4. Corner points are A, B, and C. Since the region is unbounded create two imaginary corner points: J(0,25) and K(13,25)

(a) Values:

A	B	C	J	K
-72	22	125.5	-75	55

maximum value is 125.5
location of the maximum is C.

(b) Values:

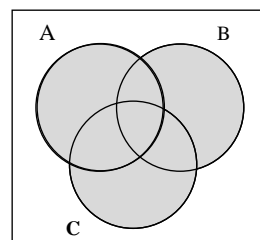| A	B	C	J	K
96	36	45	100	139

Since the maximum value is at the imaginary point K, there is no solution for this problem.

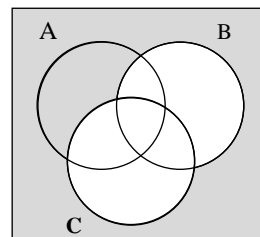5. {E, N, C, Y, L, O, P, D, I, A}

6. (a) n(A) = 4

(b) $A \cup B = \{0, 2, 3, 4, 6, 8, 9\}$
   $n(A \cup B) = 7$

(c) $C^C = \{0, 2, 4, 6, 8\}$
   $A \cup C^C = \{0, 2, 3, 4, 6, 8, 9\}$

(d) $A \cap B \cap C = \phi$

(e) $A \cap C = \{3, 9\}$
   $(A \cap C)^C = \{0, 1, 2, 4, 5, 6, 7, 8\}$
   $(A \cap C)^C \cap B = \{0, 2, 4, 6, 8\}$

(f) $2^5 = 32$

(g) $2^5 - 1 = 31$
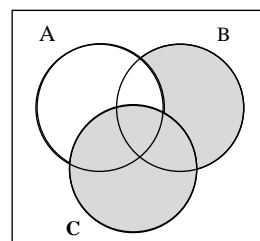
(h) no, they have 0 and 6 in common.

(i) yes

7. (a) $A \cup B \cup C$

(b) $(B \cup C)^C$

(c) $(A^C \cap B) \cup C$

8. (a) i. The A&M students that drink sprite or do not drink coffee.

   ii. The male students at A&M that drink Dr. Pepper or Sprite.

(b) i. $F \cap S \cap C^C$

   ii. $C \cup D^C$