Book: New p259: #5, 13, 25, 43

Review p152: Self-Test #3, 4
p151: 16, 22
p259: 6, 10, 24, 28, 38
p157: 14, 22
p163: 6, 10

Algebra 2 ~ Assignment 16

NEW

p259: 5. $3wz^{-4} = \boxed{\frac{3w}{z^4}}$

13. $\left(\frac{bc}{2}\right)^{-3} = \left(\frac{2}{bc}\right)^{3} = \frac{2^3}{b^3c^3} = \boxed{\frac{8}{b^3c^3}}$

25. $(a^3b^3)(ab)^{-2} = a^3b^3a^{-2}b^{-2} = a^{3-2}b^{3-2} = \boxed{ab}$

43. $\frac{40a^{-1}b^{-7}}{20a^{-5}b^{-9}} = \frac{40}{20}\cdot a^{-1-(-5)}b^{-7-(-9)} = 2a^{-1+5}b^{-7+9} = \boxed{2a^4b^2}$

packet:

1. $8^{-2} = \frac{1}{8^2} = \boxed{\frac{1}{64}}$

2. $-6(3^{-2})(81) = -6\left(\frac{1}{3^2}\right)81 = -6\cdot\frac{1}{\cancel{9}_1}\cdot\cancel{81}^{9} = -6\cdot 9 = \boxed{-54}$

3. $y^3y^{-7} = y^{3-7} = y^{-4} = \boxed{\frac{1}{y^4}}$

4. $\frac{a^{-2}b^3}{a^4b^5} = a^{-2-4}b^{3-5} = a^{-6}b^{-2} = \boxed{\frac{1}{a^6b^2}}$

5. $\left(\frac{c}{3}\right)^{-2} = \left(\frac{3}{c}\right)^{2} = \frac{3^2}{c^2} = \boxed{\frac{9}{c^2}}$

6. $(9a^{-2}b^3)^{-2} = 9^{-2}a^{(-2)(-2)}b^{3(-2)} = \frac{1}{9^2}a^4b^{-6} = \boxed{\frac{a^4}{81b^6}}$

7. $\frac{(x^3y^{-1})^2}{(xy^2)^{-2}} = \frac{x^{3(2)}y^{-1(2)}}{x^{(-2)}y^{2(-2)}} = \frac{x^6y^{-2}}{x^{-2}y^{-4}} = x^{6-(-2)}y^{-2-(-4)} = \boxed{x^8y^2}$

8. $\frac{3(x^2y)^3}{12(x^{-2}y)^4} = \frac{3x^6y^3}{12x^{-8}y^4} = \frac{\cancel{3}^{1}}{\cancel{12}_{4}}x^{6-(-8)}y^{3-4} = \frac{1}{4}x^{14}y^{-1} = \boxed{\frac{x^{14}}{4y}}$

9. $\frac{b^{-4}}{b^{-5}} = b^{-4-(-5)} = b^{-4+5} = \boxed{b}$

10. $\frac{12a^3b^{-4}}{4a^{-2}b} = \frac{12}{4}a^{3-(-2)}b^{(-4-1)} = 3a^5b^{-5} = \boxed{\frac{3a^5}{b^5}}$

11. $\left(\frac{x^{-3}y^4}{5}\right)^{-3} = \frac{x^9y^{-12}}{5^{-3}} = \frac{5^3x^9}{y^{12}} = \boxed{\frac{125x^9}{y^{12}}}$

REVIEW

12. $\frac{5}{8} + \frac{11}{24} = \frac{3}{3}\cdot\frac{5}{8} + \frac{11}{24} = \frac{15}{24} + \frac{11}{24} = \frac{26}{24} \div \frac{2}{2} = \boxed{\frac{13}{12}}$

13. $\frac{3}{3}|2x-5| = \frac{15}{3} \rightarrow |2x-5| = 5$

$2x-5 = 5$ (+5 +5) $\quad 2x-5 = -5$ (+5 +5)

$\frac{2x}{2} = \frac{10}{2} \quad \frac{2x}{2} = \frac{0}{2}$

$\boxed{x = 5,\ x = 0}$

14. x-intercept is 4; y-intercept is 2 ← b

(4,0) (0,2) $m = \frac{2-0}{0-4} = \frac{2}{-4} = \frac{-1}{2}$ $\boxed{y = \frac{-1}{2}x + 2}$

BOOK: p152

3. $y = 3x$
$x + 21 = -2y$

$x + 21 = -2(3x)$

$x + 21 = -6x$
$-x \quad -x$

$\frac{21}{-7} = \frac{-7x}{-7}$

$-3 = x$

$y = 3(-3)$
$y = -9$

$\boxed{(-3,-9)}$

4. $(4a + 3b = -2) \cdot 5$
$(5a + 7b = 17) \cdot -4$

$\rightarrow 20a + 15b = -10$
$-20a - 28b = -68$

$\frac{-13b}{-13} = \frac{-78}{-13} \rightarrow b = 6$

$4a + 3(6) = -2$
$4a + 18 = -2$
$-18 \quad -18$

$\frac{4a}{4} = \frac{-20}{4}$

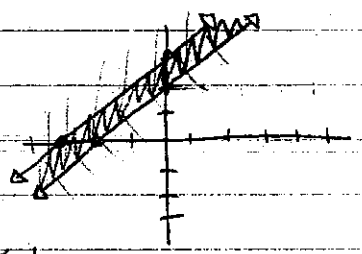
$a = -5$

$\boxed{(-5,6)}$

p151

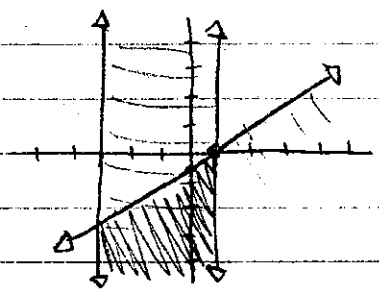
16. $y - x \leq 3$ x int: (-3,0) y int: (0,3)
$y \geq x + 2$ x int: (-2,0) y int: (0,2)

(+2)



22. $|x+1| \leq 2$ < $x+1 \leq 2 \rightarrow x \leq 1$; $x+1 \geq -2 \rightarrow x \geq -3$
$x - 2y \geq 1$ x int: (1,0) y int: $(0, -\frac{1}{2})$

(+2)



Alg 2 ~ Assignment 16, continued

p259 6. $y^5 \cdot y^7 = y^{5+7} = \boxed{y^{12}}$

10. $\frac{-2c^3d^6}{24c^2d^2} = \frac{-2}{24}c^{3-2}d^{6-2} = \frac{-1}{12}cd^4 = \boxed{\frac{-cd^4}{12}}$

24. $\frac{-x^6y^6}{x^3y^4} = -x^{6-3}y^{6-4} = \boxed{-x^3y^2}$

28. $(3a^3b)(-5a^2b^2) = -15a^{3+2}b^{1+2} = \boxed{-15a^5b^3}$

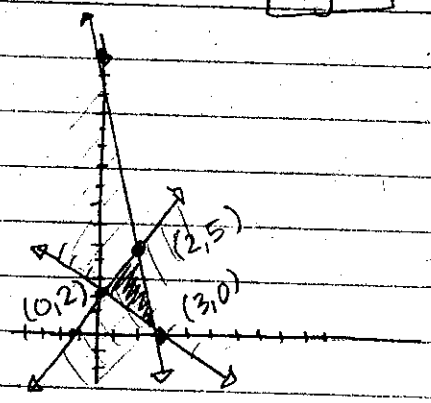
38. $\frac{2x^5y^3z^3}{8x^3y^7z} = \frac{1}{4}x^{5-3}y^{3-7}z^{3-1} = \frac{1}{4}x^2y^{-4}z^2 = \boxed{\frac{x^2z^2}{4y^4}}$

p157: 14. (x2)

$2x+3y \geq 6$ — x (3,0), y (0,2)

$3x-2y \geq -4$ — x (-4/3,0), y (0,2)

$5x+y \leq 15$ — x (3,0), y (0,15)



$f(x,y) = x+3y$

(0,2)	$0+3(2) = 6$
(3,0)	$3+3(0) = 3$
(2,5)	$2+3(5) = 17$

Max = 17 at (2,5), Min = 3 at (3,0)

22. (x2)

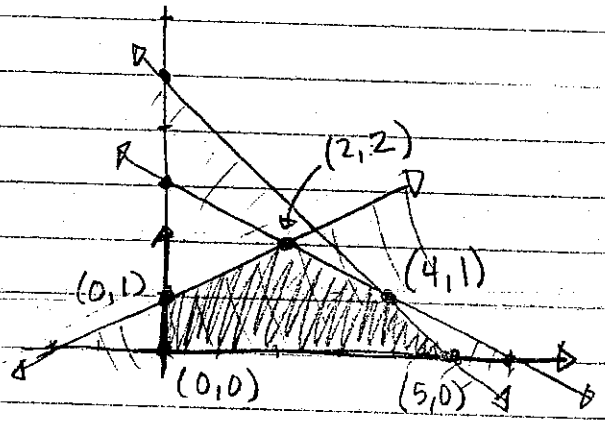
$x \geq 0$

$y \geq 0$

$x+2y \leq 6$ — x (6,0), y (0,3)

$2y-x \leq 2$ — x (-2,0), y (0,1)

$x+y \leq 5$ — x (5,0), y (0,5)



$f(x,y) = 3x-5y$

(0,0)	$3(0)-5(0) = 0$
(0,1)	$3(0)-5(1) = -5$
(2,2)	$3(2)-5(2) = -4$
(4,1)	$3(4)-5(1) = 7$
(5,0)	$3(5)-5(0) = 15$

Max is 15 at (5,0)
Min is -5 at (0,1)

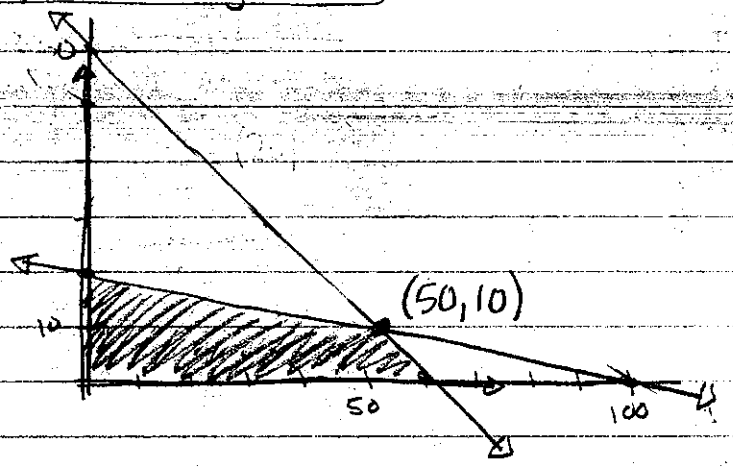
p163 6. a) x: cars, y: buses

$x \geq 0$, $y \geq 0$, $x + y \leq 60$, $6x + 30y \leq 600$

(x2)

b) $f(x,y) = 2.50x + 7.50y$

(0,0)	$2.5(0) + 7.5(0) = 0$
(0,20)	$2.5(0) + 7.5(20) = 150$
(50,10)	$2.5(50) + 7.5(10) = 200$
(60,0)	$25(60) + 7.5(0) = 150$



Max income $200 with 50 cars & 10 buses.

c) $f(x,y) = 4x + 8y$

(0,0)	$4(0) + 8(0) = 0$
(0,20)	$4(0) + 8(20) = 160$
(50,10)	$4(50) + 8(10) = 280$
(60,0)	$4(60) + 8(0) = 240$

Max income $280 with 50 cars & 10 buses.

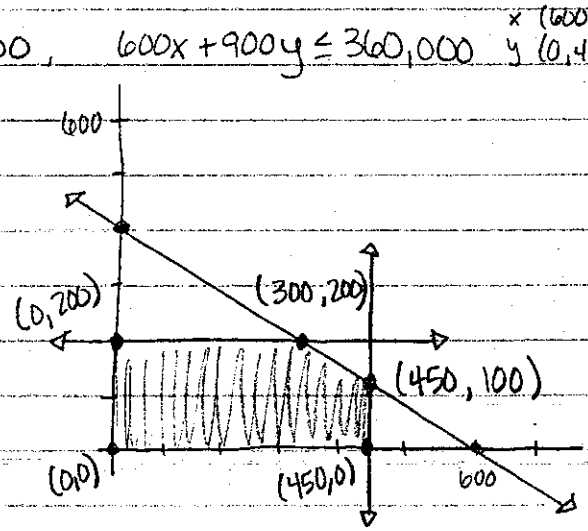
10. X = console y = wide screen

(x2)

$x \geq 0$, $y \geq 0$, $x \leq 450$, $y \leq 200$, $600x + 900y \leq 360{,}000$

$f(x,y) = 125x + 200y$

(0,0)	$125(0) + 200(0) = 0$
(0,200)	$125(0) + 200(200) = 40{,}000$
(300,200)	$125(300) + 200(200) = 77{,}500$
(450,100)	$125(450) + 200(100) = 76{,}250$
(450,0)	$125(450) + 200(0) = 56{,}250$



Max profit is $77,500 with 300 console TVs, and 200 wide-screen TVs.

Assign 16

New

Book

Pg 259 : 5, 13, 25, 43

5. Write $3wz^{-4}$ without using neg. exponents

$\boxed{\frac{3w}{z^4}}$

Simplify

13. $\left(\frac{bc}{2}\right)^{-3} = \left(\frac{2}{bc}\right)^{3} = \frac{2^3}{b^3c^3} = \boxed{\frac{8}{b^3c^3}}$

25. $(a^3b^3)(ab)^{-2} = \frac{(a^3b^3)}{(ab)^2} = \frac{a^3b^3}{a^2b^2} = \boxed{ab}$

43. $\frac{40a^{-1}b^{-7}}{20a^{-5}b^{-9}} = \frac{2a^5b^9}{a^1b^7} = \boxed{2a^4b^2}$

Packet - Simplify

1. $8^{-2} = \frac{1}{8^2} = \boxed{\frac{1}{64}}$

2. $-6(3^{-2})(81) = -\frac{6}{1}\cdot\frac{1}{3^2}\cdot\frac{81}{1} = -\frac{6}{1}\cdot\frac{1}{9}\cdot\frac{81^{9}}{1} = \boxed{-54}$

3. $y^3y^{-7} = \frac{y^3}{y^7} = \boxed{\frac{1}{y^4}}$

4. $\frac{a^{-2}b^3}{a^4b^5} = \frac{b^3}{a^4a^2b^5} = \frac{b^3}{a^6b^5} = \boxed{\frac{1}{a^6b^2}}$

5. $\left(\frac{c}{3}\right)^{-2} = \left(\frac{3}{c}\right)^{2} = \boxed{\frac{9}{c^2}}$

6. $(9a^{-2}b^3)^{-2} = \frac{1}{(9a^{-2}b^3)^2} = \frac{1}{81a^{-4}b^6} = \boxed{\frac{a^4}{81b^6}}$

7. $\frac{(x^3y^{-1})^2}{(xy^2)^{-2}} = \frac{x^6y^{-2}}{x^{-2}y^{-4}} = \frac{x^6x^2y^4}{y^2} = \boxed{x^8y^2}$

8. $\frac{3(x^2y)^3}{12(x^{-2}y)^4} = \frac{1x^6y^3}{4x^{-8}y^4} = \frac{x^6x^8}{4y} = \boxed{\frac{x^{14}}{4y}}$

Assign 16 cont

New packet cont

9. $\frac{b^{-4}}{b^{-5}} = \frac{b^5}{b^4} = \boxed{b}$

10. $\frac{12a^3b^{-4}}{4a^{-2}b} = \frac{3a^3a^2}{bb^4} = \boxed{\frac{3a^5}{b^5}}$

11. $\left(\frac{x^{-3}y^4}{5}\right)^{-3} = \left(\frac{5}{x^{-3}y^4}\right)^3 = \frac{5^3}{x^{-9}y^{12}} = \boxed{\frac{125x^9}{y^{12}}}$

Review

12. $\frac{5}{8} + \frac{11}{24} = \frac{15}{24} + \frac{11}{24} = \frac{26}{24} = \boxed{\frac{13}{12}}$

13. Solve: $\frac{3|2x-5|}{3} = \frac{15}{3}$

$|2x-5| = 5$

$2x-5=5$ $\quad$ $2x-5=-5$

$+5\ +5$ $\quad$ $+5\ +5$

$\frac{2x}{2} = \frac{10}{2}$ $\quad$ $\frac{2x}{2} = \frac{0}{2}$

$\boxed{x=5 \quad ; \quad x=0}$

14. Find equation in $y=mx+b$: x-int is 4, y-int is 2

(4,0), (0,2)

$m = \frac{2-0}{0-4} = \frac{2}{-4} = -\frac{1}{2}$ $\quad$ $\boxed{y = -\frac{1}{2}x + 2}$

Book →

Review cont.

Assign 16 cont

Book

Pg 152: self test 3, 4 (no calc) - Solve Sub or elim.

3. $y = 3x$

$x + 21 = -2y$

$x + 21 = -2(3x)$

$x + 21 = -6x$

$+6x \quad -21 \quad +6x \quad -21$

$\frac{7x}{7} = \frac{-21}{7}$

$x = -3$

$y = 3(-3)$

$y = 9$

$\boxed{(-3, 9)}$

4. $(4a + 3b = -2)(-5) \rightarrow -20a - 15b = 10$

$(5a + 7b = 17)4 \rightarrow 20a + 28b = 68$

$\frac{13b}{13} = \frac{78}{13}$

$b = 6$

$4a + 3(6) = -2$

$4a + 18 = -2$

$-18 \quad -18$

$\frac{4a}{4} = \frac{-20}{4}$

$a = -5$

$\boxed{(-5, 6)}$

Pg. 151: #16, 22 (no calc) Solve system by graphing (x-y ints)

16. $y - x \leq 3$

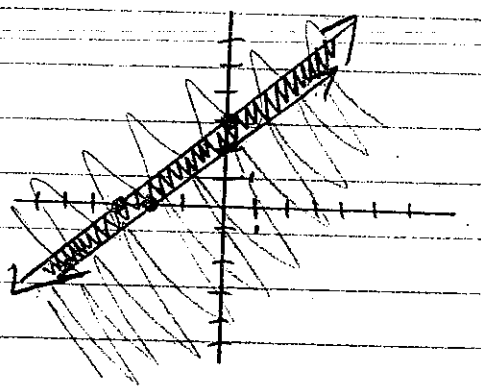
x-int: $(-3, 0)$ y-int: $(0, 3)$

Test $(0,0)$: $0 - 0 \leq 3$, $0 \leq 3$ ✓

$y \geq x + 2$

x-int: $(-2, 0)$ y-int: $(0, 2)$

Test $(0,0)$: $0 \geq 0 + 2$, $0 \geq 2$ ✗



Assign 16 cont

pg 151: 16, 22 cont

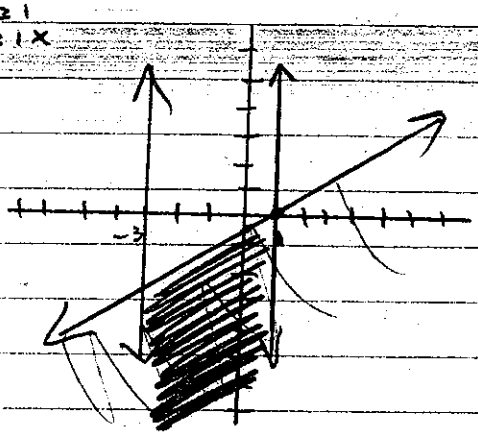
22. $|x+1| \leq 2$ $\quad x-2y \geq 1$ → x-int: $(1,0)$, y-int: $(0, -\frac{1}{2})$

Test $(0,0)$: $0-0 \geq 1$, $0 \geq 1$ ✗

$x+1 \leq 2$ $\quad x+1 \geq -2$

$-1 \quad -1$ $\quad -1 \quad -1$

$x \leq 1$ $\quad x \geq -3$



pg 259: 6, 10, 24, 28, 38 (no calc)

6. $y^5 \cdot y^7 = \boxed{y^{12}}$

10. $\frac{-2c^3d^6}{24c^3d^2} = \boxed{\frac{-1cd^4}{12} \text{ or } -\frac{1}{12}cd^4}$

24. $\frac{-x^6y^6}{x^3y^4} = \boxed{-x^3y^2}$

28. $(3a^3b)(-5a^2b^2) = \boxed{-15a^5b^3}$

38. $\frac{2x^5y^3z^3}{8x^3y^7z} = \frac{1x^2z^2}{4y^4} = \boxed{\frac{x^2z^2}{4y^4}}$

pg 157: 14, 22 (calc to find vertices if needed)

14. $2x+3y \geq 6$ → x-int: $(3,0)$ y-int: $(0,2)$

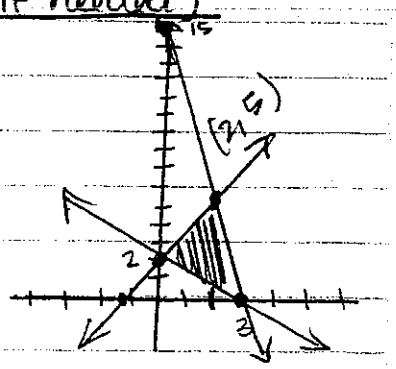
$3x-2y \geq -4$ → x-int: $(-\frac{4}{3},0)$ y-int: $(0,2)$

$5x+y \leq 15$ → x-int: $(3,0)$ y-int: $(0,15)$

$f(x,y) = x+3y$

(x,y)	$x+3y$	$f(x,y) =$
$(3,0)$	$3+3(0)=3$	$f(3,0)=3$ min
$(0,2)$	$0+3(2)=6$	$f(0,2)=6$
$(2,5)$	$2+3(5)=17$	$f(2,5)=17$ max

The min is 3 at (3,0).
The max is 17 at (2,5).



Assign 16 cont

pg 157 : 22 cont

22. $x \geq 0$

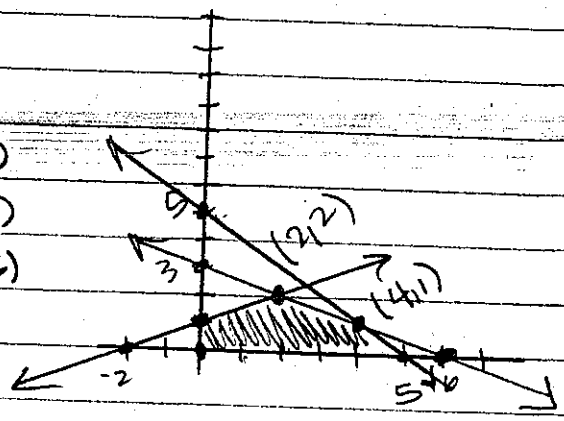
$y \geq 0$

$x + 2y \leq 6$ → x-int: (6,0) y-int: (0,3)

$2y - x \leq 2$ → x-int: (-2,0) y-int: (0,1)

$x + y \leq 5$ → x-int: (5,0) y-int: (0,5)

$f(x,y) = 3x - 5y$



(x,y)	3x - 5y	f(x,y) =
(0,0)	3(0) - 5(0) = 0	f(0,0) = 0
(5,0)	3(5) - 5(0) = 15	f(5,0) = 15 max
(4,1)	3(4) - 5(1) = 7	f(4,1) = 7
(2,2)	3(2) - 5(2) = -4	f(2,2) = -4
(0,1)	3(0) - 5(1) = -5	f(0,1) = -5 min

The max is 15 at (5,0)
The min is -5 at (0,1).

pg 163 : 6, 10 (calc to find vertices if needed)

6. c = cars (x)

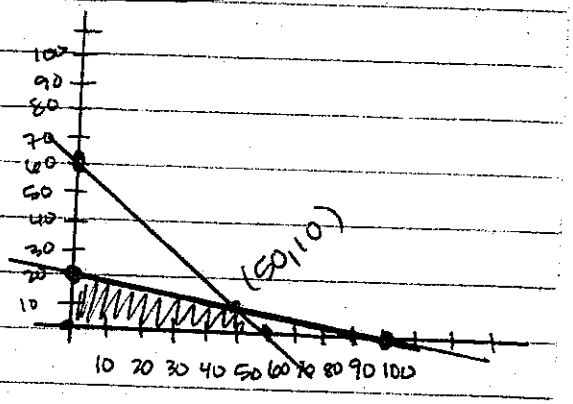
b = buses (y)

a.) $c \geq 0$

$b \geq 0$

$6c + 30b \leq 600$ → c x-int: (100,0), b y-int: (0,20)

$c + b \leq 60$ → x-int: (60,0) y-int: (0,60)



b.) $f(\overset{c}{x},\overset{b}{y}) = 2.50\overset{x}{c} + 7.50\overset{y}{b}$

(x,y)	2.5x + 7.5y	f(x,y) =
(0,0)	2.5(0) + 7.5(0) = 0	f(0,0) = 0
(60,0)	2.5(60) + 7.5(0) =	f(60,0) = 150
(50,10)	2.5(50) + 7.5(10) =	f(50,10) = 200
(0,20)	2.5(0) + 7.5(20) =	f(0,20) = 150

50 cars and 10 buses should be accepted for a max $200 income.

c.)

(x,y)	4x + 8y	f(x,y) =
(0,0)		f(0,0) = 0
(60,0)	4(60) + 8(0) = 240	f(60,0) = 240
(50,10)	4(50) + 8(10) = 280	f(50,10) = 280
(0,20)	4(0) + 8(20) = 160	f(0,20) = 160

50 cars and 10 buses should be accepted for a max $280 income.

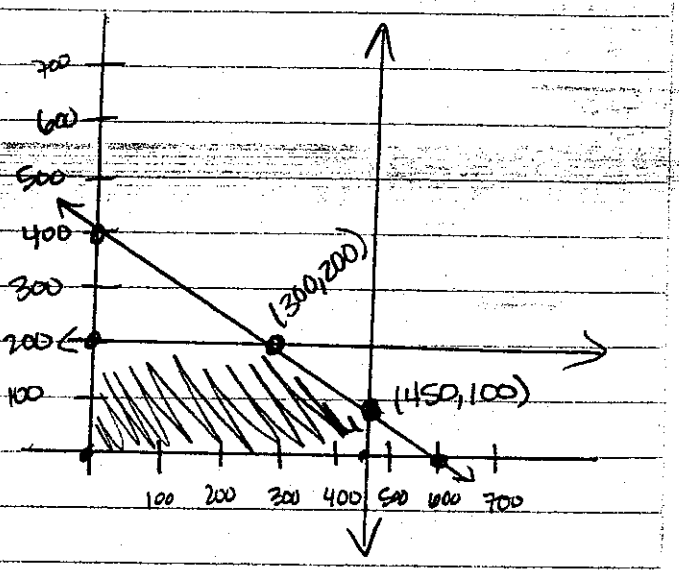
Assign 16 cont

Pg 163 : 10 cont

10. x = console TV
y = wide-screen TV

$x \leq 450 \quad x \geq 0$
$y \leq 200 \quad y \geq 0$

$600x + 900y \leq 360{,}000$
x-int: $(600, 0)$
y-int: $(0, 400)$
$y \leq \frac{(360{,}000 - 600x)}{900}$



$f(x,y) = 125x + 200y$

(x, y)	$125x + 200y$	$f(x,y) =$
$(0,0)$	$125(0) + 200(0) =$	$f(0,0) = 0$
$(450,0)$	$125(450) + 200(0) =$	$f(450,0) = 56{,}250$
$(450,100)$	$125(450) + 200(100) =$	$f(450,100) = 76{,}250$
$(300,200)$	$125(300) + 200(200) =$	$f(300,200) = 77{,}500$
$(0,200)$	$125(0) + 200(200) =$	$f(0,200) = 40{,}000$

To maximize profits, the company should make 300 console TV's and 200 wide-screen TV's.

The max profit is $\$77{,}500$.