BE - Precalc | Tuesday 9-15-09

1. The area of a circle of diameter = 24 cm (to nearest tenth). Its circumference (to nearest tenth).

Real ACT 2nd ed. Pg 165

2. The expression $a[b+(c-d)]$ is equivalent to:

(A) $ab+ac-ad$
(B) $ab+ac+ad$
(C) $ab+ac-d$
(D) $ab+c+d$
(E) $ab+c-d$

1. $A=\pi r^2$ $\quad C=2\pi r$

$$\begin{array}{r} 3.14 \\ \times\ 144 \\ \hline 1256 \\ 1256 \\ 314 \\ \hline 452.16 \end{array} \qquad \begin{array}{r} 6.28 \\ \times\ 12 \\ \hline 1256 \\ 628 \\ \hline 75.36 \end{array}$$

$\boxed{452.2\,cm^2}$ $\quad$ $\boxed{75.4\,cm}$

2. $a[b+c-d]$

$\boxed{ab+ac-ad}$

Answer (A)

Homework review: Pg 102 15-21

15. $\boxed{4}$ 16. $\boxed{0}$ 17. $\boxed{4}$ 18. $\boxed{-69}$

19. $\boxed{48}$ 20. $\boxed{26}$ 21. $\boxed{-37}$

Ch. 2-6 Solving Systems of Linear Inequalities (By graphing)

EX I Pg 107

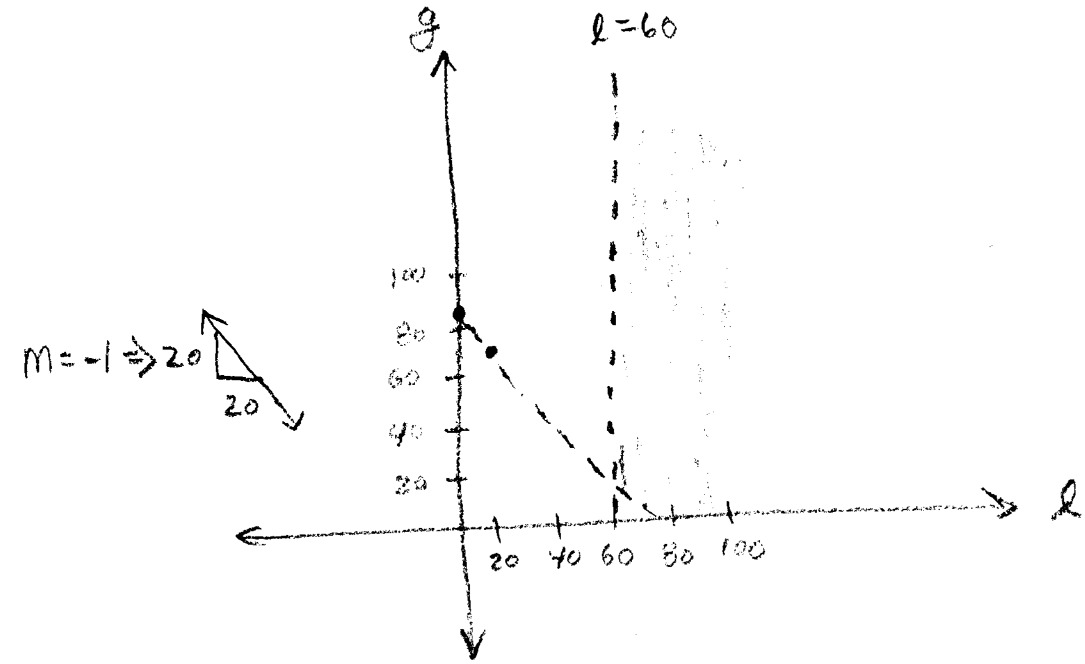
$$\begin{cases} l + g > 84 \\ l > 60 \end{cases}$$

Use (l, g) for (d, r)

Graph each boundary line, shade only the region that satisfies all inequalities (constraints)

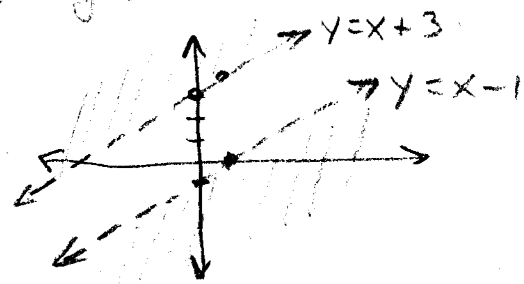
$l + g = 84 \quad \therefore \quad g = -l + 84$ - - -

$l = 60 \Rightarrow$ vertical line at $l = 60$ - - -



Note: Some systems will have no solution

Ex Pg 107



$$\begin{cases} y > x + 3 \\ y < x - 1 \end{cases}$$

Systems WITH MORE THAT 2 INEQUALITIES WILL OFTEN form A POLYGON.

Ex

<u>Vertex THeorem</u>: A FUNCTION $f(x,y) = ax + by + c$ has A MAXIMUM or MINIMUM <u>ONLY</u> AT ONE OF THE VERTICES! So you only have to check these if, as you often need to do, want to find where A function (WITHIN THE problems CONSTRAINTS) has A "greatest" (MAX) or least (MIN) VALUE.

VERTICES of intersecting lines can always be found using EBS or EBA.

Typical Problem: Ex 3 Pg 109

Find max & min values of $f(x,y) = x - y + 2$

function "f" of variables x and y

$$\text{for}\begin{cases} x + 4y \le 12 & (a) \\ 3x - 2y \ge -6 & (b) \\ x + y \ge -2 & (c) \\ 3x - y \le 10 & (d) \end{cases} \qquad \text{Line}$$

NOTE: ALL LINES ——— SOLID

(a) $4y \le -x + 12$

$y \le -\frac{1}{4}x + 3$

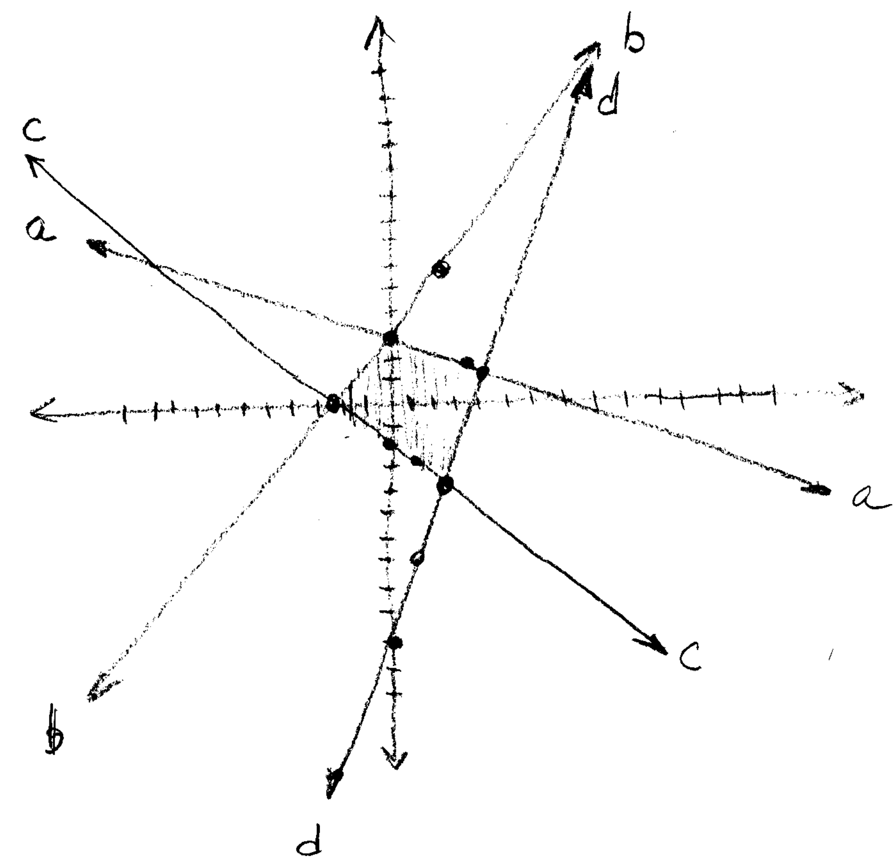
(b) $-2y \ge -3x - 6$

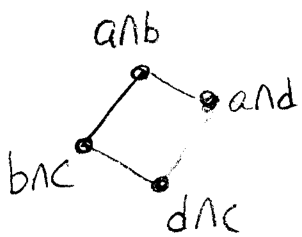
$y \le \frac{3}{2}x + 3$

(c) $y \ge -x - 2$

(d) $-y \le -3x + 10$

$y \ge 3x - 10$





Find Vertices:

$$a \wedge b \begin{cases} x+4y=12 \longrightarrow & x+4y=12 \\ 3x-2y=-6 \xrightarrow{(2)} & 6x-4y=-12 \end{cases}$$

$\boxed{(0,3)}$

$$7x = 0$$

$x=0 \therefore y=3$

$$a \wedge d \begin{cases} x+4y=12 \longrightarrow & x+4y=12 \\ 3x-y=10 \xrightarrow{(4)} & 12x-4y=40 \end{cases}$$

$\boxed{(4,2)}$

$$13x = 52$$

$x=4 \therefore y=2$

$$b \wedge c \begin{cases} 3x-2y=-6 \longrightarrow & 3x-2y=-6 \\ x+y=-2 \xrightarrow{(2)} & 2x+2y=-4 \end{cases}$$

$\boxed{(-2,0)}$

$$5x = -10$$

$x=-2 \therefore y=0$

$$d \wedge c \begin{cases} 3x-y=10 \\ x+y=-2 \end{cases}$$

$\boxed{(2,-4)}$ $4x = 8 \quad \therefore x=2 \quad \therefore y=-4$

Now: Use $f(x,y) = x - y + 2$ AT EACH (x,y) VERTEX TO FIND MAX AND MIN.

(x,y)	$f(x,y) = x - y + 2$
$(0,3)$	$f(0,3) = (0)-(3)+2 = \boxed{-1 = \text{MIN}}$
$(4,2)$	$f(4,2) = (4)-(2)+2 = 4$
$(-2,0)$	$f(-2,0) = (-2)-(0)+2 = 0$
$(2,-4)$	$f(2,-4) = (2)-(-4)+2 = \boxed{8 = \text{MAX}}$

Homework: Pg 109 # 7