LESSON 165

1. $3 = 2 + a$ Plug $(2, 3)$ into eq1.
$a = 1$ Solve for a.

$b(2) - 3 = 3$ Plug $(2, 3)$ into eq2.
$2b = 6$ Solve for b.
$b = 3$

$ab = 1(3) = 3$

2. The answer is A.
$y = 2$ is a horizontal line, so eliminate C and D.
$(0, 2)$ is on the second line, so choose A.

3. $2x + 5(-x + 3) = 6$ Plug eq1 into eq2.
$-3x + 15 = 6$ Solve for x.
$-3x = -9$
$x = 3$
$y = -3 + 3 = 0$ Plug x into eq1.

The solution is $(3, 0)$.

4. $x - 2y = 8$ eq1
$8x + 2y = 10$ eq2 × 2
$9x = 18$ Add the equations.
$x = 2$ Solve for x.

$4(2) + y = 5$ Plug x into eq2.
$y = -3$ Solve for y.

$x - y = 2 - (-3) = 5$

5. The system will have no solutions if the lines are parallel. $k = 3$ makes the lines have the same slope and thus parallel.

6. The answer is C.
A) The lines are parallel (no solutions).
B) The lines intersect at one point (one solution).
C) The lines are identical (infinitely many solutions).
D) The lines intersect at one point (one solution).

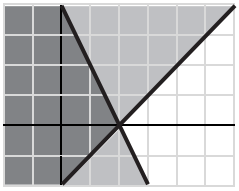
7. The answer is B.
A total of 8 tickets, so $x + y = 8$.
Total cost = x adult tickets at \$9 each + y child tickets at \$5 each,
so $9x + 5y = 52$.

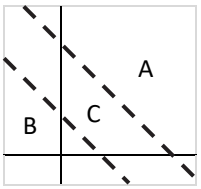
8. Let $x =$ larger integer
Let $y =$ smaller integer
Sum $= 36$, so $x + y = 36$.
The larger is 3 less than twice the smaller, so $y = 2x - 3$.
Solve the system, and you get $x = 13$ and $y = 23$.
The integers are 13 and 23.

9. Let $x =$ number of roses
Let $y =$ number of lilies
A total of 20 flowers, so $x + y = 20$.
Total cost = x roses at \$1.50 each + y lilies s at \$2.50 each,
so $1.5x + 2.5y = 38$.
Solve the system, and you get $x = 12$ and $y = 8$.
Adan used 12 roses and 8 lilies.

10. Let $x =$ price of a muffin
Let $y =$ price of a cookie
\$12.30 for 3 muffins and 4 cookies, so $3x + 4y = 12.3$.
\$28.50 for 5 muffins and 12 cookies, so $5x + 12y = 28.5$.
Solve the system, and you get $x = 2.1$ and $y = 1.5$.
Muffins cost \$2.10 each. Cookies cost \$1.50 each.

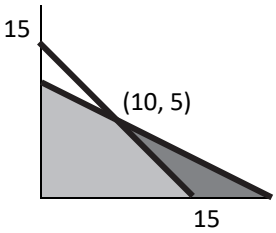
11. The answer is D.
Test a point in each region. $(1, 0)$ satisfies both inequalities.

12. 
The lines intersect at $(2, 0)$.
The maximum possible value of x is 2.

13. The answer is D.


A) The solution set is region A.
B) The solutions set is region B.
C) The solution set is region C.

14. $x =$ # of 4-seat tables
$y =$ # of 6-seat tables
At least 15 tables, so $x + y \geq 15$.
At most 70 seats, so $4x + 6y \leq 70$.



Solve the system of $x + y = 15$ and $4x + 6y = 70$ to find that the lines intersect at $(10, 5)$.
The minimum x-value of the solution region is 10.
The owner must put at least 10 4-seat tables.

15. The top line has slope $-1/4$ and y-intercept 2, so its equation is $y = (-1/4)x + 2$.
The bottom line has slope $1/4$ and y-intercept -2, so its equation is $y = (1/4)x - 2$.
Solve the system, and you get $x = 8$ and $y = 0$.