

COLLEGE ALGEBRA

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GPS #7 1.7 SYSTEM OF LINEAR EQUATIONS IN TWO VARIABLES

Class Time: 11:30 Date: 1-22-08

Useful Guidelines:

* Solving a System by Elimination

Step 1: Write both equations in standard form $Ax + By = C$.

Step 2: Make the coefficients of one pair of variable terms opposites.

Step 3: Add the new equations to eliminate a variable. Then solve for the remaining variable.

When two lines intersect in a single point, the coordinates of this point give the only solution of the system. Then the system is consistent, and the equations are independent.

When the lines are parallel to each other, the system is inconsistent and the solution set is an empty set.

When the lines are overlapped on each other. The equations are dependent. The solution set is an infinite Set of ordered pairs representing the points on the line.

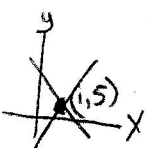
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pu Nbs!*

1. Solve each system by graphing or elimination. Is the system consistent, inconsistent or has dependent equations?

a) $(3x + 2y) = 13$ $3x + 2y = 13$ ①
 $2(4x - y) = (-1) \Rightarrow 8x - 2y = -2$ ②

one unique solution
 system is consistent
 equations are independent

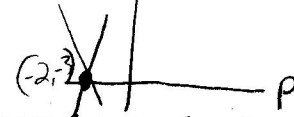
$\frac{11x}{11} = \frac{11}{11}$
 $x = 1$



$3(1) + 2y = 13$
 $3 + 2y = 13$
 $-3 \quad -3$
 $2y = 10$
 $\frac{2y}{2} = \frac{10}{2}$
 $y = 5$

b) $(p + q) = (-5) \Rightarrow 2p + 2q = -10$
 $-2p + q = 1$

$\{-2, -3\}$

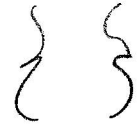


$-2p + (-3) = 1$
 $-2p = 4$
 $\frac{-2p}{-2} = \frac{4}{-2}$
 $p = -2$
 one solution consistent independent

2. Solve each system by elimination. Is the system consistent, inconsistent or has dependent equations?

a) $(x + 3y) = 4 \Rightarrow 2x + 6y = 8$
 $-2x - 6y = 3$
 $0 \neq 11$

system is inconsistent
 no solution



b) $(2A - B) = 3 \Rightarrow -6A + 3B = -9$
 $6A - 3B = 9$
 $0 = 0$

system is consistent
 equations are dependent
 infinite solutions

$\{(A, B) \mid 6A - 3B = 9\}$

3. Suppose a certain brand of laptop has supply and demand functions given by $p = 25q + 50$ and $p = 2700 - 30q$, respectively. $p = 2700 - 30q$

a) If the price p is \$350, how many units q are supplied and how many are demanded.

b) What price gives market equilibrium, and how many units are demanded and supplied at this price?

a) $350 = 25q + 50$ $q = 12$ units
 $350 = 2700 - 30q$ $q = 78.3$ $q = 78$ units

b) $(p - 25q = 50) - 1 = -p + 25q = -50$
 $p + 30q = 2700$
 $55q = 2650$
 $\frac{55q}{55} = \frac{2650}{55}$
 $q = 48$

$-p + 25(48) = -50$
 $-p + 1200 = -50$
 $-p - 1200 = -50$
 $-p = -1250$
 $p = 1250$