

Algebra 2 3.1

Solve systems of linear equations graphically*

Solve systems of linear equations using tables :(

Solve systems of linear equations algebraically*

system 2 (or more) eqns.

consistent intersection(s)

independent (x,y)

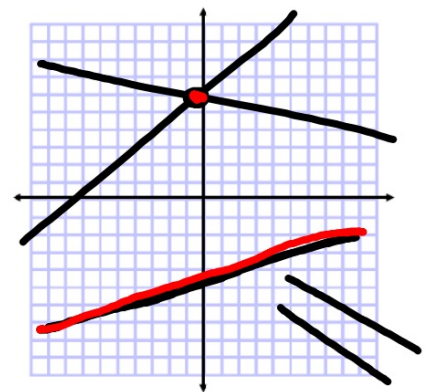
dependent all real (same line)

inconsistent NS (parallel)

substitution method (cut & paste)

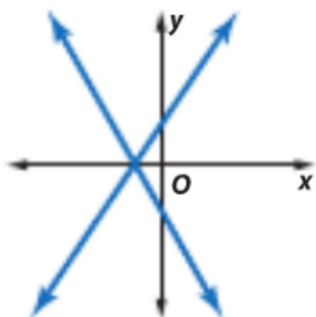
elimination method (make zero pairs)

whiteboards



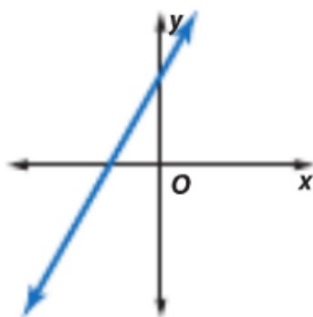
ConceptSummary Characteristics of Linear Systems

Consistent and Independent



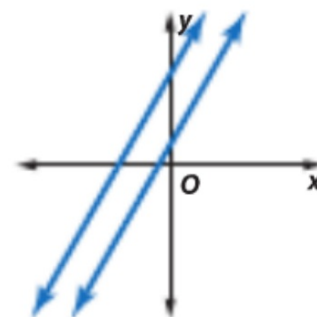
intersecting lines;
one solution

Consistent and Dependent



same line; infinitely
many solutions

Inconsistent



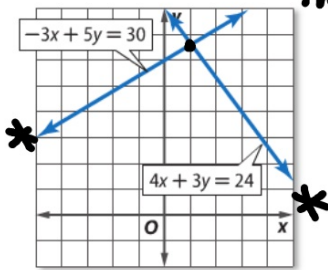
parallel lines;
no solution

Example 3 Classify Systems

Graph each system of equations and describe them as *consistent and independent*, *consistent and dependent*, or *inconsistent*.

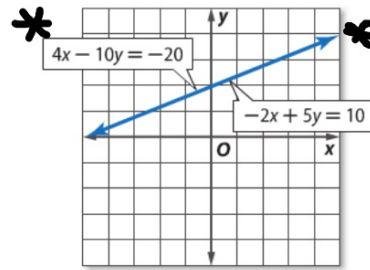
a. $4x + 3y = 24$
 $-3x + 5y = 30$

$(1, 6\frac{1}{2})$
 Cons +
 Indep.



b. $-2x + 5y = 10$
 $4x - 10y = -20$

Cons + dep
 inf many



$$y = mx + B$$

Where do the lines intersect? (IF they do...)

Estimate answers (ordered pairs) if necessary. Be as precise as possible.

Example 2 Solve by Graphing

(a) Solve the system of equations by graphing.

$$2x - y = -1$$

$$2y + 5x = -16$$

$$\begin{array}{r} -2x \\ -2x \end{array}$$

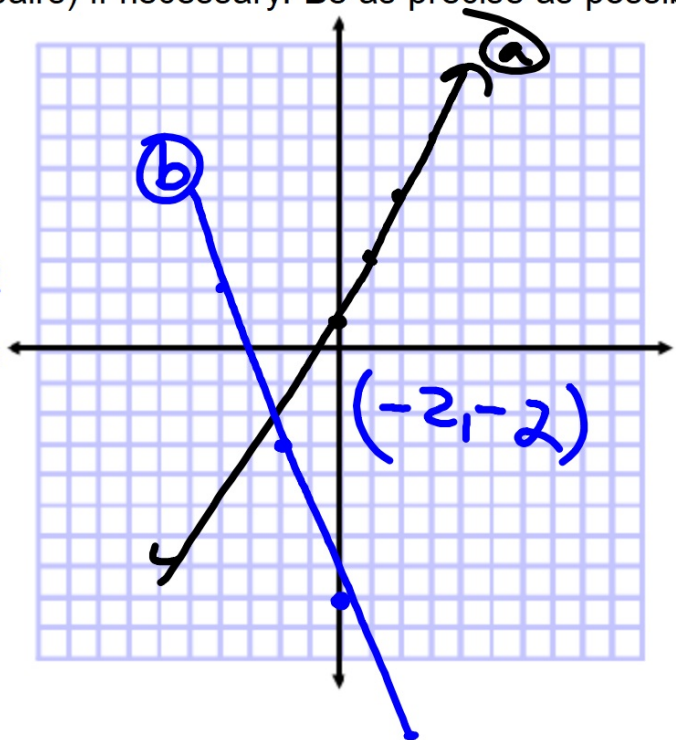
$$\begin{array}{r} -5x \\ -5x \end{array}$$

$$\frac{-y}{-1} = \frac{-2x-1}{-1} \quad \frac{-y}{-1} = \frac{-2x-1}{-1}$$

$$\frac{2y}{2} = \frac{-5x-16}{2} \quad \frac{2y}{2} = \frac{-5x-16}{2}$$

$$y = \frac{2x+1}{1}$$

$$y = -\frac{5}{2}x - 8$$



Guided Practice

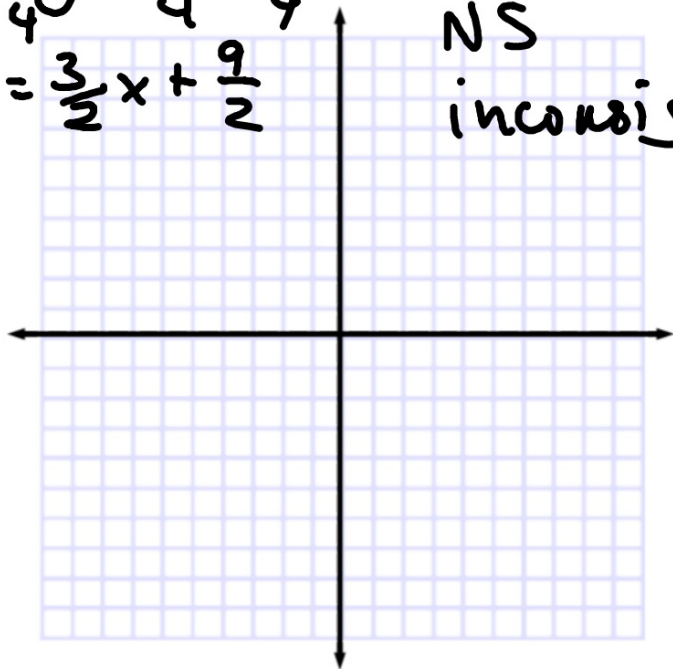
3A. $6x - 4y = 15$

$-6x + 4y = 18$

⑥ $+6x +6x$

⑥ $\frac{4y}{4} = \frac{6x+18}{4}$

$y = \frac{3}{2}x + \frac{9}{2}$



$6x - 4y = 15$
 $-6x \quad -6x$

$\frac{-4y}{-4} = \frac{-6x+15}{-4}$

② $y = \frac{3}{2}x - \frac{15}{4}$

Cut & Paste: review from Alg.1 Ch. 7

p. 138

KeyConcept Substitution Method

- Step 1** Solve one equation for one of the variables.
- Step 2** Substitute the resulting expression into the other equation to replace the variable. Then solve the equation.
- Step 3** Substitute to solve for the other variable.

You are the coach
The players can play either position...

cut & paste

Guided Practice

Use substitution to solve each system of equations.

4A. $5x - 3y = 23$
 $2x + y = 7$

$x - 7y = 11$
 $5x + 4y = -23$

$$\begin{array}{r} x - 7y = 11 \\ + 7y \quad + 7y \\ \hline x = (7y + 11) \end{array}$$

$5 \cdot -3 + 4 \cdot 2 = -23$

$-15 + -8 = (7y + 11) + 4y = -23$

$35y + 55 + 4y = -23$
 $-55 \quad -55$

$\frac{39y}{39} = \frac{-78}{39}$

$(-3, -2)$

$x = 7 \cdot -2 + 11$
 $= -14 + 11$
 $= -3$

Review from Alg 1 Ch. 7
Elimination: form zero pairs

Use elimination to solve the system of equations.

$$\begin{array}{r}
 \rightarrow 5x + 6y = -8 \\
 \rightarrow 2x + 3y = -5 \quad \xrightarrow{-2} \quad -4x - 6y = 10 \\
 \hline
 \rightarrow 4 + -9 = -5 \\
 \hline
 (2, -3)
 \end{array}$$

$$\begin{array}{r}
 5 \cdot 2 + 6y = -8 \\
 10 + 6y = -8 \\
 \hline
 6y = -18 \\
 y = -3
 \end{array}$$

$$\begin{array}{r}
 \begin{array}{r}
 6 - y = -7 \\
 -x - y = 7 \\
 \hline
 6 + -1 = 5 \\
 x + y = 5
 \end{array} \\
 \begin{array}{r}
 -y = -1 \\
 \hline
 y = 1
 \end{array} \\
 \hline
 \begin{array}{r}
 2x = 12 \\
 \hline
 x = 6
 \end{array}
 \end{array}$$

(6, -1)

elimination: form zero pairs

1A. $6x - 2y = 10$

$3x - 7y = -19$

$9 - 28 = -19$

$(3, 4)$

$6x - 2 \cdot 4 = 10$
 $6x - 8 = 10$
 $+8 \quad +8$
 $6x = 18$

$6x - 2y = 10$
 $\xrightarrow{-2} -6x + 14y = 38$

$12y = 48$
 $\frac{12}{12} \quad \frac{48}{12}$

$y = 4$

3.1 P.141
3-25
odds

1B. $9r + q = 13$
 $3r + 2q = -4$