Review: Systems of Equations

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Review: Systems of Equations

1 Solve by graphing:

$$\begin{cases} y = 2x - 3 \\ x + y = 3 \end{cases}$$

A (0, -3)
B (2, 1)
C (1, 2)
D (1, -1)
E Infinitely many solutions
F No solution

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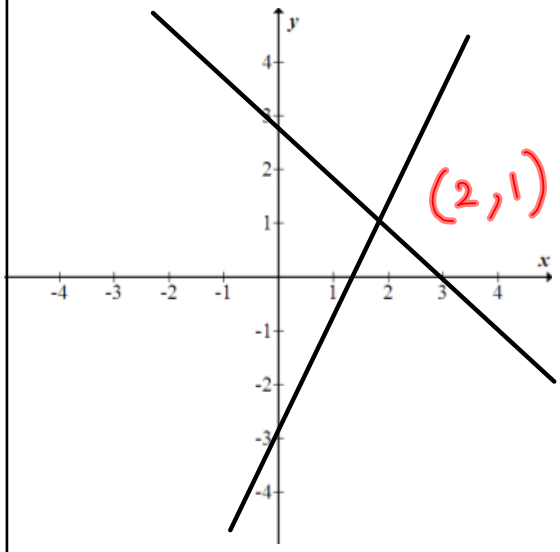
Review: Systems of Equations

$$\begin{cases} y = 2x - 3 \\ x + y = 3 \end{cases}$$



(2,1) is the solution

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Review: Systems of Equations
Solving by Graphing

For full credit, you must:
- graph the first line,
- graph the second line,
- together on the same graph,
- read the solution from the point of intersection,
- give both coordinates as an ordered pair.

A correct solution without a correct graph isn't worth very much.

There will be opportunities on the test to show that you can solve a system by elimination or substitution.

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Review: Systems of Equations

2 Solve by substitution:

$$\begin{cases} -x + y = -1 \\ 2x - y = 4 \end{cases}$$

A (0, -1)
B (1, -2)
C (1, 0)
D (3, 2)
E Infinitely many solutions
F No solution

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Review: Systems of Equations

Solve by substitution:

$$\begin{cases} -x + y = -1 \\ 2x - y = 4 \end{cases}$$

solve for y → $y = x - 1$

sub. into other equation

$2x - (x - 1) = 4$

$2x - x + 1 = 4$

$x + 1 = 4$

$x = 3$

$y = x - 1$

$y = 3 - 1$

$y = 2$

$(3, 2)$

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Review: Systems of Equations
Solving by Substitution

For full credit, you must:
- solve an equation for a variable (unless it is given to you like that),
- substitute into the other equation,
- solve the other equation to obtain one coordinate of the solution,
- obtain the other coordinate,
- give both coordinates as an ordered pair.

A correct solution without the substitution isn't worth very much.

There will be opportunities on the test to show that you can solve a system by graphing or elimination.

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Review: Systems of Equations

3 Solve by elimination: (addition)

$$\begin{cases} x + 2y = 1 \\ -4x - 5y = -7 \end{cases}$$

A (3, -1)
B (-1, 1)
C (-7, 7)
D (1, 0)
E Infinitely many solutions
F No solution

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Review: Systems of Equations

Solve by elimination:

$$\begin{cases} x + 2y = 1 \\ -4x - 5y = -7 \end{cases}$$

$\cdot 4 \rightarrow$ $4x + 8y = 4$

no change $\rightarrow$ $-4x - 5y = -7$

$3y = -3$

$y = -1$

$x + 2(-1) = 1$

$x - 2 = 1$

$x = 3$

solution: $(3, -1)$

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Review: Systems of Equations
Solving by Elimination

For full credit, you must:
- multiply equations so that they have a pair of opposite terms,
- add the equations together, eliminating that variable,
- solve that equation to obtain one coordinate of the solution,
- obtain the other coordinate,
- give both coordinates as an ordered pair.

A correct solution without the addition step isn't worth very much.

There will be opportunities on the test to show that you can solve a system by graphing or substitution.

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Review: Systems of Equations

4 Solve the system:

$$\begin{cases} -x + 2y = 1 \\ 3x + 3 = 6y \end{cases}$$

A (-3, -1)
B (0, 0)
C (-1, 0)
D (1, 1)
E Infinitely many solutions
F No solution

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Review: Systems of Equations

Solve the system:

$$\begin{cases} -x + 2y = 1 \\ 3x + 3 = 6y \end{cases}$$

$-x + 2y = 1 \xrightarrow{\cdot 3} -3x + 6y = 3$

$3x - 6y = -3 \xrightarrow{\text{no change}} 3x - 6y = 3$

$0 = 0$

Lines coincide
Infinitely many solutions
System is dependent

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Review: Systems of Equations
Lines that Coincide

For full credit, you must:
- solve the system, obtaining 0 = 0 or some other "always true" equation,
- recognize that this is a special case, and write either
  * Lines coincide, or
  * Infinitely many solutions, or
  * System is dependent.

Obtaining 0 = 0 without knowing what it means isn't worth very much.

You can always put both equations into slope-intercept form to help you decide what to write.

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Review: Systems of Equations

5 Solve the system:

$$\begin{cases} 3x + y = 7 \\ -2y = 6x - 10 \end{cases}$$

A (1, 4)
B (2, 1)
C (3, -4)
D (0, 5)
E Infinitely many solutions
F No solution

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Review: Systems of Equations

Solve the system:

$$\begin{cases} 3x + y = 7 \\ -2y = 6x - 10 \end{cases}$$

solve for y → $y = -3x + 7$

sub back into other eq. ←

$-2(-3x + 7) = 6x - 10$

$6x - 14 = 6x - 10$

$-14 = -10$

Never true

Parallel lines
No solutions
Inconsistent System

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Review: Systems of Equations
Parallel lines

For full credit, you must:
- solve the system, obtaining 0 = 4 or some other "never true" equation,
- recognize that this is a special case, and write either
  * Parallel lines, or
  * No solution, or
  * System is inconsistent.

Obtaining 0 = 4 without knowing what it means isn't worth very much.

You can always put both equations into slope-intercept form to help you decide what to write.

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6 Chandra has 5 liters of a 32% solution of sodium hydroxide in a container. What percentage concentration of sodium hydroxide solution must she add to this in order to end up with 8 liters of 35% solution? Give the percentage as a whole number.

	liters of solution	x	% concentration	=	liters of sodium hydroxide
weak	5		0.32		1.6
strong	x		y		xy
mix	8		0.35		2.8

Two equations

$5 + x = 8$

$x = 3$

$1.6 + xy = 2.8$

$1.6 + 3y = 2.8$

$3y = 1.2$

$y = 0.4$

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Review: Systems of Equations
Applications

For full credit, you must:
- interpret the given information as a system of equations with two variables,
- solve the system,
- interpret the coordinates of the solution to answer the question.

An answer without a system of equations isn't worth very much.

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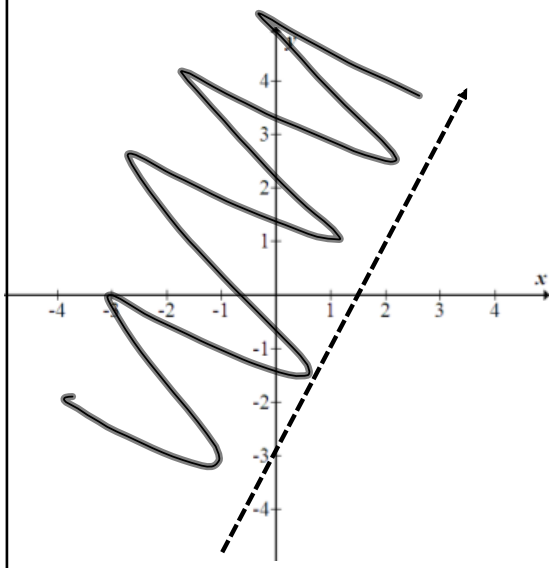
7 Khang and Hector live 76 miles apart in southeastern Missouri. They decide to bicycle towards each other and meet somewhere in between. Hector's speed is 90% of Khang's. They start out at the same time and meet 5 hours later. Give Hector's speed as a decimal.

Nov 3-8:24 PM

Review: Graphing Linear Inequalities

Graph $2x - y < 3$



Boundary line

$2x - y = 3$

$y = 2x - 3$

Dashed

Nov 8-7:36 PM

Review: Graphing Linear Inequalities

For full credit, you must:
- graph the boundary line in the correct place,
- make it solid or dashed as appropriate,
- and shade the correct side of the boundary line.

A boundary line without shading isn't worth very much.

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