

Unit 1: Relationships, Quiz 2 Exemplars!

Use these exemplars to examine
and grow from your mistakes!

Name _____

Course: IB MYP 9 Math Standard Level

Teachers: Berg, Connelly, Oberebmt, Paulson, Perkins

UNIT1 Linear: Relationships

Key Concept: **Relationships**

Related Concept(s): **Change, System**

Global Context: **Scientific and technical innovation**

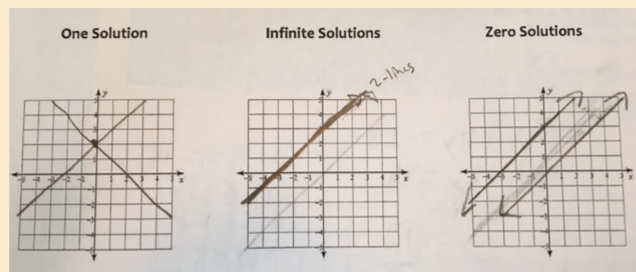
Statement of Inquiry: **Investigating changes among systems enables us to understand relationships in our world.**

Task Title: Solving Systems of Equations Quiz

Task Description: Students will demonstrate their understanding of graphing, substitution, and elimination to solve a system of equations.

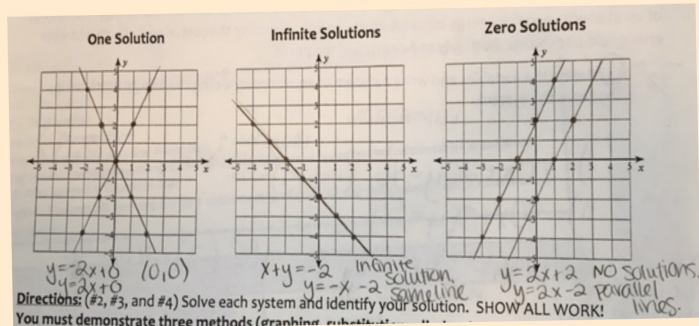
7	<ul style="list-style-type: none"> Select appropriate mathematics when solving challenging problems in both familiar and unfamiliar situations. 	8	<ul style="list-style-type: none"> Apply the selected mathematics successfully when solving these problems. Generally solve these problems correctly. 	<ul style="list-style-type: none"> All special cases for solutions are illustrated. All problems are solved without error. <ul style="list-style-type: none"> -Graphing - Substitution - Elimination Both challenge solutions found.
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Version 1



Version 1

Great detail to support the graphs!



Version 1

Substitution Method

$$\begin{aligned}
 &2. \quad -2x + 2y = -4 \\
 &\quad \quad y = 4x + 1 \\
 &\quad \quad -2x + 2(4x + 1) = -4 \\
 &\quad \quad -2x + 8x + 2 = -4 \\
 &\quad \quad 6x + 2 = -4 \\
 &\quad \quad 6x = -6 \\
 &\quad \quad x = -1 \\
 &\quad \quad -2(-1) + 2y = -4 \\
 &\quad \quad 2 + 2y = -4 \\
 &\quad \quad 2y = -6 \\
 &\quad \quad y = -3
 \end{aligned}$$

Version 2

$$\begin{array}{l}
 3. \\
 -4x + 4y = -8 \\
 4x + 3y = -6 \\
 \hline
 -4x + 4y = -8 \\
 4x + 3y = -6 \\
 \hline
 4y = -8 \\
 3y = -6 \\
 \frac{4y}{3} = \frac{-8}{3} \\
 y = -2 \\
 \hline
 4x + 3(-2) = -6 \\
 4x - 6 = -6 \\
 +6 \quad +6 \\
 4x = 0 \\
 \frac{4x}{4} = \frac{0}{4} \\
 x = 0 \\
 \hline
 (0, -2)
 \end{array}$$

Version 1 Student graphed each of their systems.

Directions: (#2, #3, and #4) Solve each system and identify your solution. SHOW ALL WORK!
Utilize the graph paper on your rubric if you would like to solve by graphing!

2. A $-2x + 2y = -4$
B $y = 4x + 1$ graphing ✓

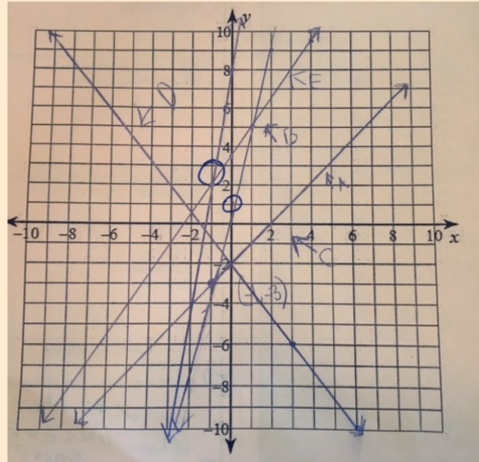
$$\begin{array}{l}
 -2x + 2y = -4 \\
 +2x \\
 \hline
 2y = 2x - 4 \\
 \frac{2y}{2} = \frac{2x - 4}{2} \\
 y = x - 2 \\
 (-1, -3)
 \end{array}$$

3. C $-4x + 4y = -8$ graphing ✓
D $4x + 3y = -6$

$$\begin{array}{l}
 -4x + 4y = -8 \\
 +4x \\
 \hline
 4y = 4x - 8 \\
 \frac{4y}{4} = \frac{4x - 8}{4} \\
 y = x - 2 \\
 (0, -2)
 \end{array}$$

Ⓟ $\frac{4x}{4} + \frac{3y}{3} = \frac{-6}{3}$
 $\frac{4x}{3} + 3y = -6$
 $\frac{4x}{3} = -4x - 6$
 $y = -\frac{4}{3}x - 2$

Version 1 Student graphed each of their systems.



Equations are labeled A, B, C, D, E, and F.

Version 1

Directions: (#2, #3, and #4) Solve each system and identify your solution. SHOW ALL WORK!
Utilize the graph paper on your rubric if you would like to solve by graphing!

$$\begin{array}{l}
 4. \quad \begin{cases} -6x + 4y = 14 \\ -12x + 2y = 16 \end{cases} \\
 \hline
 12x - 8y = -28 \\
 -6y = -12 \\
 \boxed{y = 2} \\
 \end{array}
 \qquad
 \begin{array}{l}
 -6x + 4(2) = 14 \\
 -6x + 8 = 14 \\
 -6x = 6 \\
 \boxed{x = -1} \\
 \end{array}$$

$(-1, 2)$

Version 1

Directions: (#2, #3, and #4) Solve each system and identify your solution. SHOW ALL WORK!
Utilize the graph paper on your rubric if you would like to solve by graphing!

4.

$$\begin{aligned} -6x + 4y &= 14 \\ -12x + 2y &= 16 \end{aligned}$$
$$\begin{array}{r} (-6x + 4y = 14) \cdot 2 \\ -12x + 2y = 16 \\ \hline 12x - 8y = -28 \\ -12x + 2y = 16 \\ \hline -6y = -12 \\ \frac{-6y}{-6} = \frac{-12}{-6} \\ y = 2 \end{array}$$
$$\begin{array}{r} -6x + 4 \cdot 2 = 14 \\ -6x + 8 = 14 \\ -8 \quad -8 \\ \hline -6x = 6 \\ \frac{-6x}{-6} = \frac{6}{-6} \\ x = -1 \end{array}$$
$$\begin{pmatrix} -1, 2 \end{pmatrix}$$

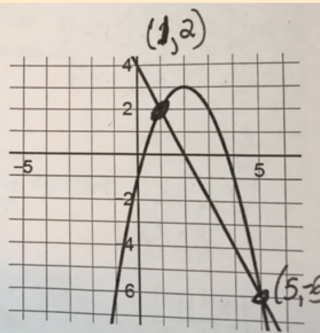
Version 1

5. The graph at right shows the following system of equations:

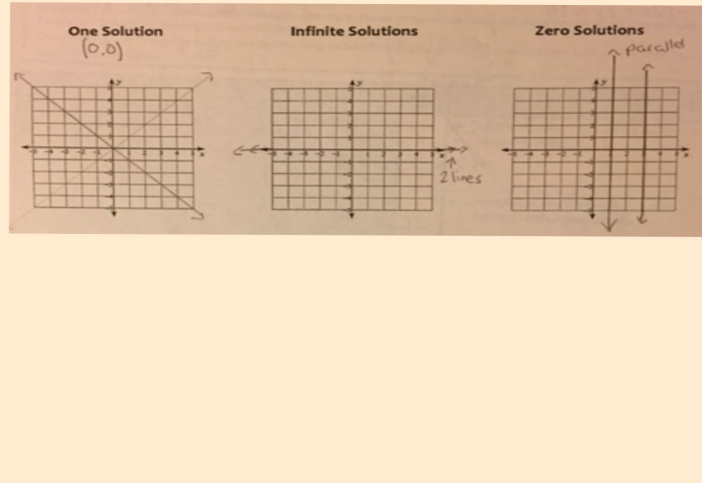
$$\begin{aligned} f(x) &= -x^2 + 4x - 1 \\ g(x) &= -2x + 4 \end{aligned}$$

Use the graph to find the solution to this system of equations.

$$(1, 2) \quad (5, -6)$$



Version 2



Version 2

2. Substitution
 $2x + 2y = 4$
 $y = 4x - 3$
 $2x + 2(4x - 3) = 4$
 $2x + 8x - 6 = 4$
 $10x - 6 = 4$
 $\quad +6 \quad +6$

 $10x = 10$
 $\div 10 \quad \div 10$
 $x = 1$
 $y = 4(1) - 3$
 $y = 4 - 3$
 $y = 1$
 $\boxed{(1, 1)}$

Version 2

3.

$$\begin{array}{l} -4x + 4y = -8 \\ 4x + 3y = -6 \end{array}$$
$$\begin{array}{r} -4x + 4y = -8 \\ 4x + 3y = -6 \\ \hline 4y = -8 \\ 3y = -6 \\ \frac{4y}{3} = \frac{-8}{-6} \\ y = -2 \end{array} \quad \begin{array}{l} 4x + 3 \cdot (-2) = -6 \\ 4x - 6 = -6 \\ +6 \quad +6 \\ \hline 4x = 0 \\ \frac{4x}{4} = \frac{0}{4} \\ x = 0 \end{array}$$
$$y = -2 \quad (0, -2)$$

Version 2

4. multiplication

$$\begin{array}{l} 8x - 2y = 18 \\ (-4x + 5y = 3) \cdot 2 \\ \hline 8x - 2y = 18 \\ -8x + 10y = 6 \\ \hline 8y = 24 \\ \div 8 \quad \div 8 \\ \hline y = 3 \end{array} \quad \begin{array}{l} -4x + 5(3) = 3 \\ -4x + 15 = 3 \\ -15 \quad -15 \\ \hline -4x = -12 \\ \div -4 \quad \div -4 \\ \hline x = 3 \end{array}$$
$$(3, 3)$$

Version 2

5. The graph at right shows the following system of equations:

$$f(x) = x^2 - 4x$$

$$g(x) = 2x - 5$$

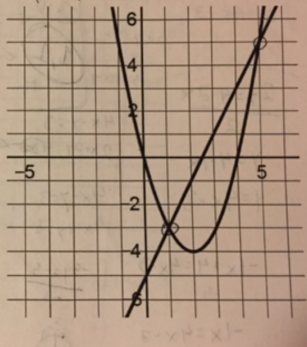
Use the graph to find the solution to this system of equations.

(1, -3)

(5, 5)

$$5 = 10 - 5 \checkmark$$

$$5 = 25 - 20 \checkmark$$



Version 2

5. The graph at right shows the following system of equations:

$$f(x) = -x^2 + 4x - 1$$

$$g(x) = -2x + 4$$

Use the graph to find the solution to this system of equations. There are two intersections.

(1, 2) and (5, -6)

