Algebra Quiz 7.1 to 7.2 Review

7.1 Graphing Systems of Equations

Use the graph at the right to determine whether each system has no solution, one solution, or infinitely many solutions.

1. \( x + y = 3 \)
   \( x + y = -3 \)

2. \( 2x - y = -3 \)
   \( 4x - 2y = -6 \)

3. \( x + 3y = 3 \)
   \( x + y = -3 \)

4. \( x + 3y = 3 \)
   \( 2x - y = -3 \)

7.1 Graphing Systems of Equations

Graph each system of equations. Then determine whether the system has no solution, one solution, or infinitely many solutions. If the system has one solution, name it.

1. \( y = -2 \)
   \( 3x - y = -1 \)

2. \( x = 2 \)
   \( 2x + y = 1 \)
7.1 Graphing Systems of Equations

Graph each system of equations. Then determine whether the system has no solution, one solution, or infinitely many solutions. If the system has one solution, name it.

3. \( y = \frac{1}{2}x \)
   \[ x + y = 3 \]

4. \( 2x + y = 6 \)
   \[ 2x - y = -2 \]

5. \( 3x + 2y = 6 \)
   \[ 3x + 2y = -4 \]

6. \( 2y = -4x + 4 \)
   \[ y = -2x + 2 \]
7.2 Substitution

Use substitution to solve each system of equations. If the system does not have exactly one solution, state whether it has no solution or infinitely many solutions.

1. $y = 6x$
   $2x + 3y = -20$

2. $x = 3y$
   $3x - 5y = 12$

3. $x = 2y + 7$
   $x = y + 4$

4. $y = 2x - 2$
   $y = x + 2$
7.2 Substitution
Use substitution to solve each system of equations. If the system does not have exactly one solution, state whether it has no solution or infinitely many solutions.

5. \(y = 2x + 6\)
   \(2x - y = 2\)

6. \(3x + y = 12\)
   \(y = -x - 2\)

7. \(x + 2y = 13\)
   \(-2x - 3y = -18\)

8. \(x - 2y = 3\)
   \(4x - 8y = 12\)
7.1 Graphing Systems of Equations

Use the graph at the right to determine whether each system has **no solution**, **one solution**, or **infinitely many solutions**.

1. \( x + y = 3 \)
   \( x + y = -3 \)
   **none**

2. \( 2x - y = -3 \)
   \( 4x - 2y = -6 \)
   **infinitely many**

3. \( x + 3y = 3 \)
   \( x + y = -3 \)
   **one**

4. \( x + 3y = 3 \)
   \( 2x - y = -3 \)
   **one**

7.1 Graphing Systems of Equations

Graph each system of equations. Then determine whether the system has **no solution**, **one solution**, or **infinitely many solutions**. If the system has one solution, name it.

1. \( \begin{align*}
   y &= -2 \\
   3x - y &= -1 \\
   \end{align*} \)

2. \( \begin{align*}
   x &= 2 \\
   2x + y &= 1 \\
   \end{align*} \)

   **one solution** \((-1, -2)\)

   **one solution** \((2, -3)\)
7.1 Graphing Systems of Equations

Graph each system of equations. Then determine whether the system has no solution, one solution, or infinitely many solutions. If the system has one solution, name it.

3. \( y = \frac{1}{2} x \)
\[ x + y = 3 \]
\[ y = -x + 3 \]

4. \( 2x + y = 6 \)
\[ 2x - y = -2 \]
\[ 2x + y = 6 \]
\[ -2x - 2x + y = -2 \]
\[ y = -2x + 6 \]

5. \( 3x + 2y = 6 \)
\[ 3x + 2y = -4 \]
\[ -3x + 6 \]
\[ 2y = -3x + 6 \]
\[ 2y = -3x + 6 \]
\[ 2 \]
\[ y = \frac{3}{2} x + 3 \]
\[ y = -2x - 2 \]

6. \( 2y = -4x + 4 \)
\[ 2y = -4x + 4 \]
\[ 2 \]
\[ y = -2x + 2 \]

\[ \frac{3x + 2y = -4}{-3x} \]
\[ 2y = -3x - 4 \]
\[ y = -2x - 2 \]

\[ \text{no solution} \]
\[ \text{parallel} \to \text{same slope} \]

\[ \frac{2y = -4x + 4}{2} \]
\[ \text{infinitely many solutions} \]
\[ \text{same line!} \]
### 7.2 Substitution

Use substitution to solve each system of equations. If the system does not have exactly one solution, state whether it has no solution or infinitely many solutions.

1. \( y = \frac{6x}{2} \)
   \[ 2x + 3y = -20 \]
   \[ 2x + 3(6x) = -20 \]
   \[ 2x + 18x = -20 \]
   \[ 20x = -20 \]
   \[ x = -1 \]
   \[ y = 6(-1) \]
   \[ y = -6 \]
   \[ (-1, -6) \]

2. \( x = \frac{3y}{3} \)
   \[ 3x - 5y = 12 \]
   \[ 3(3y) - 5y = 12 \]
   \[ 9y - 5y = 12 \]
   \[ 4y = 12 \]
   \[ y = 3 \]
   \[ x = 3y \]
   \[ x = 3(3) \]
   \[ x = 9 \]
   \[ (9, 3) \]

### 7.2 Substitution

Use substitution to solve each system of equations. If the system does not have exactly one solution, state whether it has no solution or infinitely many solutions.

3. \( x = \frac{2y + 7}{x} \)
   \[ x = y + 4 \]
   \[ 2y + 7 = y + 4 \]
   \[ y = -3 \]
   \[ x = 2y + 7 \]
   \[ x = 2(-3) + 7 \]
   \[ x = 1 \]
   \[ (1, -3) \]

4. \( y = \frac{2x - 2}{y} \)
   \[ y = x + 2 \]
   \[ 2x - 2 = x + 2 \]
   \[ x = 4 \]
   \[ y = 2x - 2 \]
   \[ y = 2(4) - 2 \]
   \[ y = 6 \]
   \[ (4, 6) \]
7.2 Substitution

Use substitution to solve each system of equations. If the system does not have exactly one solution, state whether it has no solution or infinitely many solutions.

5. \[ y = \frac{2x + 6}{2x - y} = 2 \]
\[ 2x - (2x + 6) = 2 \]
\[ 2x - 2x - 6 = 2 \]
\[ -6 = 2 \]
\[ \text{not true} \]
\[ \text{no solution} \]

6. \[ 3x + y = 12 \]
\[ y = -x - 2 \]
\[ 3x + (-x - 2) = 12 \]
\[ 3x - x - 2 = 12 \]
\[ 2x - 2 = 12 \]
\[ 2x = 14 \]
\[ x = 7 \]
\[ y = -x - 2 \]
\[ y = -(7) - 2 \]
\[ y = -9 \]
\[ (7, -9) \]

7.2 Substitution

Use substitution to solve each system of equations. If the system does not have exactly one solution, state whether it has no solution or infinitely many solutions.

7. \[ x + 2y = 13 \]
\[ 2x - 3y = -18 \]
\[ -2(-2y + 13) - 3y = -18 \]
\[ 4y - 26 - 3y = -18 \]
\[ y - 26 = -18 \]
\[ y = -8 \]
\[ x = -2y + 13 \]
\[ x = -2(-8) + 13 \]
\[ x = 16 + 13 \]
\[ x = -3 \]
\[ (-3, 8) \]

8. \[ x - 2y = 3 \]
\[ 4x - 8y = 12 \]
\[ 4(2y + 3) - 8y = 12 \]
\[ 8x + 12 - 8y = 12 \]
\[ 12 = 12 \]
\[ \text{true!} \]
\[ \text{infinitely many solutions} \]