Systems of Equations

Bell Work:

1. **Find the intersection. Show all work.**

$$3x + 4y = 44$$

$$2x - 3y = 1$$

2. **What type of answer do you have if you have parallel lines?**

3. **What type of answer do you have if you have coinsiding lines?**

4. **What is the name of parent function with an equation of $f(x) = c$?**

Systems of Equations

Solve.

1. $2x + 5y = 36$

$$y = \frac{1}{4}x + 2$$

Use substitution because one of the equations is slope-intercept.

$$2x + 5\left(\frac{1}{4}x + 2\right) = 36$$

$$2x + \frac{5}{4}x + 10 = 36$$

$$8x + 5x + 40 = 144$$

$$13x = 104$$

$$x = 8$$

Solve.

$$y = \frac{1}{4}(8) + 2 = 6$$

Substitute the answer into one of the equations to find the other answer.

The answer: $(8,\ 6)$

Systems of Equations

Solve.

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

$2x + 3y = 12$

Use substitution because one of the equations is slope-intercept.

$2x + 3\left(-\frac{2}{3}x + 6\right) = 12$

Solve.

$2x - 2x + 18 = 12$

$18 = 12$

There is no solution because 18 does not equal 12.

Any time that one number equals another number (0 = -4 or -8 = 13), they are parallel lines and have no solution.

The answer: **No Solution**

Systems of Equations

Solve.

3. $16x + 12y = -32$

(-4) $4x + 3y = -8$

Use elimination because both equations are standard.

$$16x + 12y = -32$$

$$-16x - 12y = 32$$

$$0 = 0$$

Solve.

There are infinitely many solutions because these are coinsiding lines.

Any time that one number equals another number (0 = 0 or -8 = -8), they are coinsiding lines and have infinitely many solutions.

The answer: **Infinitely Many Solutions**

Systems of Equations

Solve.

4. $x + 2y = 9$

$$y = -\frac{1}{2}x - 4$$

Use substitution because one of the equations is slope-intercept.

$$x + 2\left(-\frac{1}{2}x - 4\right) = 9$$

Solve.

$$x - x - 8 = 9$$

$$-8 = 9$$

There is no solution because -8 does not equal 9.

Any time that one number equals another number (0 = -4 or -8 = 13), they are parallel lines and have no solution.

The answer: **No Solution**

Systems of Equations

Solve.

5. $4x - 2y = 20$

$y = 2x - 10$

Use substitution because one of the equations is slope-intercept.

$4x - 2(2x - 10) = 20$

Solve.

$4x - 4x + 20 = 20$

$20 = 20$

There are infinitely many solutions because these are coinsiding lines.

The answer: **Infinitely Many Solutions**

Any time that one number equals another number (0 = 0 or -8 = -8), they are coinsiding lines and have infinitely many solutions.

Systems of Equations

Solve.

6. $y = \frac{3}{2}x + 13$

$y = \frac{1}{4}x - 7$

Use substitution because both of the equations are slope-intercept.

$(4)\ \frac{3}{2}x + 13 = \frac{1}{4}x - 7\ (4)$

$6x + 52 = x - 28$

$5x = -80$

$x = -16$

Solve.

$y = \frac{1}{4}(-16) - 7 = -11$

Substitute the answer into one of the equations to find the other answer.

The answer: $(-16,\ -11)$

Systems of Equations

Type of Lines:

1. **Intersecting Lines**
2. **Parallel Lines**

   $0 = -16$ **or** $7 = 13$

3. **Coinsiding Lines**

   $0 = 0$ **or** $-3 = 3$

Answer:

The point where they intersect

No Solution

Infinitely Many Solutions

Systems of Equations

Assignment:

FLEUNCY PRACTICE: Systems of Equations Worksheet