

Write Expressions

- Let k represent the number of Instagram followers that Kelly has.
 - Amy has 15 more followers than Kelly. Write an expression for the number of followers that Amy has.
 $k + 15$
 - James has 12 less followers than Kelly. Write an expression for the number of followers that James has.
 $k - 12$
 - Ivana has a fourth as many followers as Kelly. Write an expression for the number of followers that Ivana has.
 $\frac{1}{4}k$
 - Challenge:** Simeon has 6 less than three times as many followers as Kelly. Write an expression for the number of followers that Simeon has.
 $3k - 6$
- Below is Mr. Johnson's attempt at writing an expression to match a number trick. Explain Mr. Johnson's mistake and demonstrate the correct work below his attempt.

Choose a number. Subtract 4. Multiply by 3. Add 8. Subtract your original number.

$$x \xrightarrow{-4} x - 4 \xrightarrow{\times 3} 3(x - 4) \xrightarrow{+8} 3x + 4 \xrightarrow{-x} 2x + 4$$

$3x - 4$

Mistake Mr. Johnson made: He did not distribute

Correct work:

$$x \xrightarrow{-4} x - 4 \xrightarrow{\times 3} 3x - 12 \xrightarrow{+8} 3x - 4 \xrightarrow{-x} 2x - 4$$

- Use 7 for the following number trick: Add 8. Multiply by 2. Subtract your original number. Subtract 13. What is your ending number?

$$7 \xrightarrow{+8} 15 \xrightarrow{\times 2} 30 \xrightarrow{-7} 23 \xrightarrow{-13} 10$$

- Write an expression in terms of x for the number trick in #2 above. Show your work and simplify each step.

$$x \xrightarrow{+8} x + 8 \xrightarrow{\times 2} 2x + 16 \xrightarrow{-x} x + 16 \xrightarrow{-13} x + 3$$

Evaluate Expressions

- Fun fact: At Disney World, you can never take more than 30 steps without reaching a trash can. The number of trash cans per square yard can be estimated by the expression $\frac{y}{10} - 1$, where y is the number of square yards. How many trash cans would you expect to find in a courtyard that spans 600 square yards?

$$\frac{600}{10} - 1 = 60 - 1 = 59$$

Evaluate Expressions (continued)

6. Evaluate the expression $\frac{3-x^2}{x+3}$

a. for $x = 5$

$$\frac{3-5^2}{5+3} = \frac{3-25}{8} = \frac{-22}{8} = -\frac{11}{4} \text{ or } -2\frac{3}{4}$$

b. for $x = -5$

$$\frac{3-(-5)^2}{-5+3} = \frac{3-25}{-2} = \frac{-22}{-2} = 11$$

Simplify Expressions

7. Simplify the expressions below:

a. $-3(p+7)$

$$-3p - 21$$

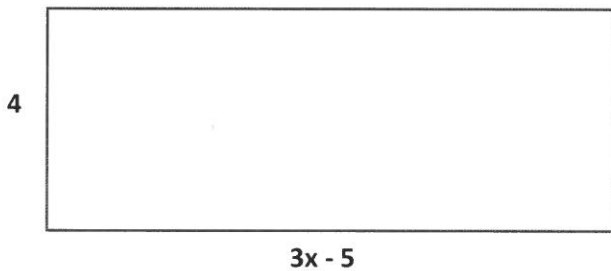
b. $8 - (x - 5)$

$$8 - x + 5 \\ 13 - x$$

c. $3n + 4y - 2 - 7y - n + 7$

$$2n - 3y + 5$$

8. Write a simplified expression for the area and the perimeter of the rectangle below:



Area:

$$4(3x - 5) \\ 12x - 20$$

Perimeter:

$$4 + 3x - 5 + 4 + 3x - 5 \\ 6x - 2$$

Binary Operations

9. Let the binary operation $x \nabla y$ be defined as $-8x + 2y - 3$.

a. Find $1 \nabla -4$ $[x=1, y=-4]$

$$-8(1) + 2(-4) - 3 \\ -8 - 8 - 3 \\ -19$$

b. Find $-5 \nabla 6$ $[x=-5, y=6]$

$$-8(-5) + 2(6) - 3 \\ 40 + 12 - 3 \\ 49$$

c. Anastasia found $3 \nabla 7$. Her work is below. Is she correct? Explain why or why not.

$$-8(7) + 2(3) - 3 \\ -56 + 6 - 3 \\ -53$$

Explanation:

NO, she switched x and y.