

Study the example problem showing how to determine whether or not expressions are equivalent. Then solve problems 1-7.

Example

Carl and Felipa are trying to write an expression that is equivalent to the expression $6 - 4(3 - 6x) + 12x$. Which student wrote an equivalent expression?

Carl

$$\begin{aligned} 6 - 4(3 - 6x) + 12x \\ 2(3 - 6x) + 12x \\ 6 - 6x + 12x \\ 6 + 6x \end{aligned}$$

Felipa

$$\begin{aligned} 6 - 4(3 - 6x) + 12x \\ 6 - 12 + 24x + 12x \\ -6 + 36x \end{aligned}$$

Felipa wrote an equivalent expression. She correctly multiplied $-4(3 - 6x)$ before adding or subtracting. She then combined like terms correctly. Carl did not write an equivalent expression.

- 1) Explain what Carl did incorrectly.

- 2) Is $5 + 3(1 - x)$ equivalent to $8 - 8x$?

Show your work.

Solution: _____

- 3) Is $2(6 - 3x) + x$ equivalent to $2(3x) + x$?

Show your work.

Solution: _____

Solve.

4 Is $1 + 4(3x - 10) - 12x$ equivalent to -9 ?

Show your work.

Solution: _____

5 Use substitution to show that $9 + 6(10 - 7x)$ is equivalent to $69 - 42x$.

Show your work.

Solution: _____

6 Is $\frac{1}{8} - 10\left(\frac{3}{4} - \frac{3}{8}x\right) + \frac{5}{8}x$ equivalent to $-\frac{1}{8}(59 - 35x)$? Explain your answer.

7 If z is a positive integer, does $4 + 3(2z - 5)$ represent a number that is *greater than*, *less than*, or *equal to* $2(3z - 4)$?

Show your work.

Solution: _____

Name: _____

Solve the problems.

1 Which expression is equivalent to $3n + 2(1 - 4n)$?

- A $2 - n$ C $2 + 11n$
B $2 - 5n$ D $2 - 11n$

Samuel chose **A** as the correct answer. How did he get that answer?

To simplify this expression, what should you do first?



2 The width of a rectangle is represented by $5 + 2y$. The length is twice as long as the width. What is the perimeter of the rectangle? Select all correct expressions.

- A $4(5 + 2y)$
B $6(5 + 2y)$
C $20 + 8y$
D $30 + 12y$

A diagram might help you solve this problem.



3 The length of one side of a square field is represented by the expression $3 - 7x$.

- a. Write an expression for the perimeter of the field expressed as a sum.
- b. What is an expression for the perimeter of the field expressed as a product?
- c. Use the distributive property to write the product in part (b) as an equivalent expression.

How do you find the perimeter of a square?



Solve.

4 Tell whether each statement is *True* or *False*.

- a. $2(3 - 4y) = 6 - 4y$ True False
- b. $3 + 5(9 + 2n) = 48 + 5n$ True False
- c. $9 - 3(y - 2) = 3 - 3y$ True False
- d. $3(6x - 2) - 7 = 18x - 13$ True False

How do you know when expressions are equivalent?



5 The expression $24y + 36$ represents the cost of a dozen eggs. Use factoring to write an expression that is equivalent to $24y + 36$. Then write an expression for the cost of one egg.

How do you factor an expression?



6 Roberto examines several geometric figures. The length of each side of each figure is $(2d - 7)$ feet. Using the following table, write the number of sides and two different expressions for the perimeter of each figure.

Figure	NUMBER OF SIDES	Perimeter Expression 1	Perimeter Expression 2
Pentagon			
Octagon			
Triangle			
Hexagon			
Square			

The prefix of the figure name indicates the number of sides in the figure.



7 Use the distributive property to find an expression that is equivalent to $2x(x + 7) - (3x + 1)$.

Show your work.

You will need to use an exponent in the answer.



Solution: _____