

Packet 3: Expressions, Equations, and Applications

Dear Parents/Guardians,

In Expressions and Equations: Packet 3, students move from building and drawing expressions and equations to formal algebra. In Lesson 1, students simplify expressions using both sketches and symbolic notation. In Lesson 2, students begin to solve problems using numbers with larger absolute values and note the importance of using formal algebra for such problems. In Lesson 3, students create and solve equations when given a variety of contexts.

Equivalent Expressions: Cups and Counters

Students build, sketch, and create equivalent expressions using cups and counters. They represent a “-x” with the symbol \blacktriangle . Using “zero pairs,” students simplify expressions.

Symbolic Notation	Sketch
$3(x - 1) - 5x + 4$	$\blacktriangledown - \blacktriangledown - \blacktriangledown - \blacktriangle \blacktriangle \blacktriangle \blacktriangle \blacktriangle + + + +$
$3x - 3 - 5x + 4$	$\blacktriangledown \blacktriangledown \blacktriangledown - - - \blacktriangle \blacktriangle \blacktriangle \blacktriangle \blacktriangle + + + +$
$3x - 5x - 3 + 4$	$\blacktriangledown \blacktriangledown \blacktriangledown \blacktriangle \blacktriangle \blacktriangle \blacktriangle \blacktriangle - - - + + + +$
Remove zero pairs.	
$-2x + 1$	$\blacktriangle \blacktriangle +$

Solving Equations: From Balance to Properties

Though students may still draw or build their equations with cups/ counters, they will also solve equations using formal algebraic notation and justify each move/step they make.

Picture	Equation/Steps	What did you do?
	$-2(x+1) = -4x-6$ $-2x-2 = -4x-6$	Distributive Property
	$-2 = -2x-6$	Add $2x$ to both sides.
	$4 = -2x$	Add 6 to both sides.
	$2 = -x$ $-2 = x$ $x = -2$	Divide both sides by 2 . Take the opposite.

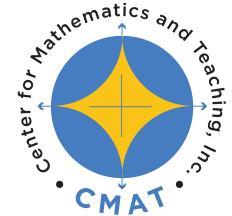
Application Problems

Students create equations for a variety of situations. They use formal algebra to solve their equations. Many of their solutions will be rational values instead of integers.

Example: Ben is saving for a phone that costs \$285. He has \$50 in savings. If he saves \$25 a month, how long will it take Ben to save for his phone? Let x represent the number of months he needs to save.

$$\begin{array}{r} 50 + 25x = 285 \\ -50 \quad -50 \\ \hline 25x = 235 \\ x = 9.4 \end{array}$$

Ben would need to save for 10 months to buy the phone.



EXPRESSIONS AND EQUATIONS PACKET 3

By the end of the packet, your student should know...

- How to write and simplify expressions [Lesson 3.1](#)
- How to build, draw, write, and solve equations from a balance model [Lesson 3.2](#)
- Create and solve equations from problems in context [Lesson 3.3](#)

Additional Resources

For definitions and additional notes, please refer to section 3.5.