

Complete the Equations

Information for students

- Use your knowledge of algebraic equations to find solutions to the three problems below.
- Challenge yourself to find more than one solution to each problem.
- Hints and possible solutions can be found in Appendix A.

Materials required

- Paper, writing materials
- Calculator (optional)

Problem 1: Writing Equivalent Polynomial Expressions¹

Use digits 1 to 9 to create a statement that is true. Use each digit only once.

$$\boxed{}x^2 + \boxed{}x^3 + \boxed{}x^2 - \boxed{}x^3 = \boxed{}x^2 + \boxed{}x^3 - \boxed{}x^2$$

Problem 2: Creating an Equation with a Given Solution²

Use digits 0 to 9 to fill in the boxes to write three equations whose solution is $-1/2$. Use each digit only once.

$$\boxed{}x + \boxed{} = \boxed{}x + \boxed{}$$

Problem 3: Multiplying Binomials³

Fill in the boxes with any numbers that make this equation true.

$$(\boxed{}x - 3)(\boxed{}x + \boxed{}) = 12x^2 - \boxed{}x - 15$$

Information for parents

- Read the instructions with your child, if needed.
- Encourage your child to keep trying. They may need to come back to a problem several times before finding a solution that works.
- If you wish, try the challenge with your child.

Appendix A: Hints and Possible Solutions

Problem 1: Writing Equivalent Polynomial Expressions

Hints:

Use what you know about addition/subtraction facts (for example: $3+4 = 2+5$)

Possible Answers:

There are many possible answers, including: $3x^2 + 6x^3 + 4x^2 - 1x^3 = 9x^2 + 5x^3 - 2x^2$.

Problem 2: Creating an Equation with a Given Solution

Hints:

What does it mean to be a solution of the equation?

How would you check if a value is a solution to an equation?

What kind of numbers would you put in for the coefficients of x ?

Possible Answers:

There are many possible answers, including the following:

$$2x + 5 = 4x + 6 \quad 2x + 7 = 4x + 8 \quad 8x + 5 = 4x + 3$$

Problem 3: Multiplying Binomials

Hints:

What number is the easiest to fill in? What are the factors of 12?

Possible Answers:

There are many possibilities. Here are some: 2, 6, 5, and 8; 1, 12, 5, and 31.