LESSON MAKER PRO

Equal or Not?

Evaluate expressions and solve equations.

HIGH SCHOOL · FA.A.5

FA.A.5 "Compare and contrast an expression and an equation and give examples of each."

NAME _____ DATE _____

THE BIG IDEA

An expression names a value and has no equals sign. An equation says two quantities are equal. You can evaluate an expression for a given value of x, but you solve an equation to find values of x that make it true.

WORKED EXAMPLE

Compare 11x + 17 when x = 5 with 11x + 17 = 72. Identify the expression and the equation, then evaluate or solve each one.

1. 11x + 17 is an expression. 11x + 17 = 72 is an equation.
2. Evaluate the expression: 11(5) + 17 = 55 + 17 = 72.
3. Solve the equation: 11x = 55, so x = 5.

Answer: The expression has a value of 72 when x = 5. The equation has the solution x = 5.

PRACTICE 6 problems

1 Identify each as an expression or an equation: 6x + 8 and 6x + 8 = 26. Then evaluate the expression when x = 2.

ANSWER _____

2 Solve 9x - 2 = 34. Is 9x - 2 an expression or an equation?

ANSWER _____

3 Evaluate 2x + 9 when x = 6. Is 2x + 9 = 21 true when x = 6?

ANSWER _____

4 The expression is 8x - 6. Write an equation using this expression that has x = 2 as a solution.

ANSWER _____

5 Which value of x, 0 or 2, makes 3x + 12 = 18 true? What is the value of the expression 3x + 12 when x = 0?

ANSWER _____

6 A student calls 15 - 2x = 9 an expression because it has x. Correct the label and solve for x.

ANSWER _____

APPLY IT Show your work

1 A streaming service charges $8 a month plus $2 for each movie rental. Write an expression for the monthly cost of x rentals. Then write and solve an equation for a monthly bill of $22.

WORK SPACE

ANSWER _____

2 An esports club collects $6 from each player who enters a tournament and pays a $24 equipment fee. Write an expression for the club's profit with x players. Then write and solve an equation for a profit of $54.

WORK SPACE

ANSWER _____

CHALLENGE One step up

A student says, "2(x + 6) = 2x + 12 is an equation, so it has just one solution." Is the student correct? Explain how this equation differs from the expression 2(x + 6), and find the expression's value when x = 4.

WORK SPACE AND ANSWER

Equal or Not?

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Identify each as an expression or an equation: 6x + 8 and 6x + 8 = 26. Then evaluate the expression when x = 2.	**6x + 8 is an expression; 6x + 8 = 26 is an equation. The expression's value is 20.**
2	Solve 9x - 2 = 34. Is 9x - 2 an expression or an equation?	**x = 4; 9x - 2 is an expression.**
3	Evaluate 2x + 9 when x = 6. Is 2x + 9 = 21 true when x = 6?	**The expression's value is 21. Yes, the equation is true.**
4	The expression is 8x - 6. Write an equation using this expression that has x = 2 as a solution.	**8x - 6 = 10**
5	Which value of x, 0 or 2, makes 3x + 12 = 18 true? What is the value of the expression 3x + 12 when x = 0?	**x = 2 makes the equation true. The expression's value when x = 0 is 12.**
6	A student calls 15 - 2x = 9 an expression because it has x. Correct the label and solve for x.	**It is an equation because it has an equals sign. x = 3.**

PART 2 · APPLY IT

1. **Expression: 8 + 2x. Equation: 8 + 2x = 22. Solution: x = 7 rentals.** Subtract 8 from both sides of the equation, then divide by 2.
2. **Expression: 6x - 24. Equation: 6x - 24 = 54. Solution: x = 13 players.** Add 24 to both sides of the equation, then divide by 6.

CHALLENGE

No. It is an equation, but distributing gives 2x + 12 = 2x + 12, which is true for every value of x. The expression 2(x + 6) has no equals sign, and its value when x = 4 is 20.

Accept equivalent expressions and equations in the word problems. For the challenge, accept any explanation that the equation is true for every value of x, not just one.