

# UNIT 4 EQUATIONS + INEQUALITIES

DEF

EQUATION: AN EQUATION IS A MATHEMATICAL SENTENCE CONTAINING AN EQUAL SIGN(=) THAT SHOWS 2 EQUIVALENT EXPRESSIONS.

$$4x + 2 = 6$$

Diagram illustrating the components of the equation  $4x + 2 = 6$ :  
- **COEFFICIENT**: 4 (indicated by a red arrow pointing to the number 4)  
- **VARIABLE**:  $x$  (indicated by a green arrow pointing to the letter  $x$ )  
- **CONSTANTS**: 2 and 6 (indicated by a red bracket under the 2 and 6)

DEF

SOLUTION TO AN EQUATION IS A NUMBER THAT CAN REPLACE THE VARIABLE TO MAKE AN EQUATION TRUE.

$$x + 3 = 7$$

SOLUTION IS 4.

$$4 + 3 = 7$$
$$7 = 7 \checkmark$$

CHECK SOLUTION

- 1) SUBSTITUTE
- 2) EVALUATE
- 3) YES OR NO

PROB  $x - 7 = 12$   $x = 8$   
SUB  $8 - 7 = 12$   
EVAL  $1 \neq 12$   
NOT A SOLUTION

SUB  $x + 3 = 5$   $x = 2$   
SUB  $2 + 3 = 5$   
EVAL  $5 = 5 \checkmark$   
YES

## \* SOLVING ONE-STEP EQUATIONS \*



INVERSE OPERATIONS ARE OPPOSITE OPERATIONS THAT "UNDO" EACH OTHER

+	INVERSE	-	<u>2</u> + 3 = 5 - 3 = 2
-	INVERSE	+	
x	INVERSE	÷	
÷	INVERSE	x	

PROPERTY OF EQUALITY: IF YOU ADD, SUBTRACT, MULTIPLY OR DIVIDE A NUMBER FROM BOTH SIDES OF AN EQUATION, THE TWO SIDES REMAIN EQUAL.

$$\frac{3(2+7)-7}{3} = \frac{3(2+7)-7}{3}$$

$$2+8 = 2+8$$

ISOLATE THE VARIABLE

ADD  $x + 10 = 17$   
 $\frac{-10 \quad -10}{x = 7}$  ① INVERSE OPERATION  
② SOLUTION

SUBSTITUTION

$7 + 10 = 17$  ③  
 $17 = 17$  ✓ ④  
CHECK

SUBTRACTION  $x - 3 = 14$   
 $\frac{+3 \quad +3}{x = 17}$  ①  
②

$17 - 3 = 14$  ③  
 $14 = 14$  ✓ ④

MULTIPLICATION  $4x = 16$   
 $\frac{4 \quad 4}{x = 4}$  ①  
②

$4 \cdot 4 = 16$  ③  
 $16 = 16$  ✓ ④

DIVISION  $2 \cdot \frac{x}{2} = 16 \cdot 2$  ①  
 $x = 32$  ②

$\frac{32}{2} = 16$  ③  
 $16 = 16$  ✓ ④