



# Algebra 1 Workbook

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Rules of equations

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MATH

## EVALUATING EXPRESSIONS

- 1. Explain what went wrong in the following statement?

If  $x^2 - x + 1$  when  $x = -2$ , then  $-2^2 - -2 + 1 = -4 + 2 + 1 = -1$ .

- 2. In your own words, what does it mean to “evaluate an expression”?

- 3. Find the value of  $x$  in  $x + 1 = y - 2z$ , when  $y = 4$  and  $z = -3$ .

- 4. Evaluate the expression when  $a = 1$ ,  $b = -3$ , and  $c = -4$ .

$$\frac{\sqrt{b^2 - 4ac}}{2a}$$

- 5. Show that  $x = -4$  by plugging it into the following expression.

$$x^2 - 4 = -3x$$



## INVERSE OPERATIONS

■ 1. Use inverse operations to solve for  $x$  in  $3x = 5$ .

■ 2. What is the inverse operation of division?

■ 3. Using division and multiplication, write two ways that we can solve for  $x$ .

$$\frac{1}{5}x = 10$$

■ 4. What value of the missing exponent would make the equation true?

$$(x^3)^? = x$$

■ 5. Put an expression in place of the question mark that would make the equation true.

$$\frac{1}{7} ? = 7$$

■ 6. Using inverse operations, solve for  $x$ .



$$2x^2 = 8$$

■ 7. What went wrong in the following set of steps?

$$2 - \frac{1}{3}x = 1$$

$$-\frac{1}{3}x = 3$$

$$x = -9$$



## SIMPLE EQUATIONS

- 1. Solve for  $x$ .

$$2x - 5 = 11$$

- 2. If  $x = 16$ , what number would make the following equation true?

$$x - ?? = 11$$

- 3. Solve for  $x$ .

$$\frac{x + 1}{3} = 7$$

- 4. What went wrong in the following set of steps?

$$2x - 11 = -3$$

$$2x = 8$$

$$x = 16$$



## BALANCING EQUATIONS

- 1. How would you solve for  $x$  in the following equation?

$$\frac{x}{4} = -5$$

- 2. What is the next step in balancing the following equation? In words, explain why.

$$2x - 3 = 5x$$

- 3. Solve for  $x$  in the following equation.

$$2(-3x + 5) - 1 = -3(1 - 5x)$$

- 4. What went wrong in the following steps?

$$-2x + 3 = 3x$$

$$-2x + 3 - 2x = 3x - 2x$$

$$3 = x$$

- 5. What missing term makes sense in the following series of steps?



$$-3(4 - 10x) + 2 = 5x$$

$$-12 + 30x + 2 = 5x$$

$$-10 + ?? = 5x$$

- 6. Solve for  $x$  in the following equation.

$$(x - 1) + 2(3x + 1) = -4(1 - x) + 9$$

- 7. What would be your next step in balancing the equation? Explain why.

$$2x - 6 + 5x + 10 = 11 - 3x + x + 4$$

- 8. Solve for  $x$  in the following equation.

$$x - 2(1 - x) + 5 = 3(2x + 4) - 6$$

- 9. What missing equation would make the solution true?

$$-2(4 - x) = 5(-3x + 1) + 7$$

$$-8 + 2x = -15x + 12$$

$$????? = ???????$$

$$17x = 20$$



$$x = \frac{20}{17}$$

10. Explain what's incorrect in the following set of steps.

$$2x - 1 = 4 - 3x$$

$$1 - 4 = -3x - 2x$$

11. What number would make the following true?

$$-7x + 4 = 3x - 11$$

$$??x = -15$$

12. Solve for  $x$  in the given equation.

$$5 - x = 17 - 4x$$

13. What went wrong in the following set of steps?

$$-4 - x - 2x = 5x - 11$$

$$-4 - 3x = 5x - 11$$

$$-15 = 8x$$





- 14. If  $x = -2$ , solve for  $y$  in the given equation.

$$3x + 2y - 7 = 1 - 5x - y$$

- 15. What missing equation would make the solution true?

$$6x - 13 + 5x = -x + 9$$

$$11x - 13 = -x + 9$$

$$12x - 13 = 9$$

$$?? = ??$$

$$x = \frac{22}{12}$$

- 16. What missing value would make the following true?

$$2y + 5 = -x + 3 - 5x$$

$$2y + 5 = ??x + 3$$

- 17. If  $y = -3$ , solve for  $x$  in the given equation.

$$2x - (x + y) = 5y - x + 7$$



- 18. Solve for  $y$  in the given equation.

$$3x - 2y + 5 = -5x + 7$$

- 19. Solve for the variable by keeping the equation balanced.

$$-(6c - 5) = 4(7c - 8) + 3$$

- 20. Solve for the variable.

$$7(4a - 3) = -(6a - 5) + 8$$

- 21. Solve the equation.

$$4x - 3 = 17$$



