Algebra 1 Workbook

Rules of equations

krista king 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 when 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.

$$4x - 3 = 17$$


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