Algebra 1 Workbook

Equations

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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. What does it mean to "evaluate an expression"?

3. Find the value of $y - 2z - 1$ 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 equation.

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

6. Evaluate the expression when $a = -1$, $b = -2$, and $c = -3/2$.

$$\frac{5a + 1}{3 - 2b + 4c^2a}$$

INVERSE OPERATIONS

1. Use inverse operations to figure out what should replace the "?" in order to make the equation true.

$$5x \ ? = x$$

2. What is the inverse operation of division?

3. Using both division and multiplication, find two values that can replace the "?" in order to make the equation true.

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

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.

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

6. Use inverse operations to find a value to replace the "?" that will make the equation true.

$$(\sqrt[4]{a+b})^{?} = a+b$$

SIMPLE EQUATIONS

1. Solve the equation for x.

$$2x - 5 = 11$$

2. If $x = 16$, what value of the "??" would make the equation true?

$$x - ?? = 11$$

3. Solve the equation for x.

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

4. What went wrong in this set of steps?

$$2x - 11 = -3$$

$$2x = 8$$

$$x = 16$$

5. What went wrong in this set of steps?

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

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

$$x = -9$$

6. Solve the equation for x.

$$\frac{1}{4}x + 3 = 5$$

BALANCING EQUATIONS

1. Solve the equation for x.

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

2. Solve the equation for x.

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

3. If $x=-2$, solve for y.

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

4. Solve for a.

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

5. Solve for a.

$$-2(1-a)+3(a+7)=-2$$

6. What missing number should replace the "??" in order to make the equation true?

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

$$??x + 15 = 3x - 3$$

EQUATIONS WITH SUBSCRIPTS

1. It takes Peter 6 hours to paint a room and Laura 8 hours to paint that same room. Use the equation below to determine how long it would take for Peter and Laura to paint the room together, where R_1 is the number of hours it takes Peter, R_2 is the number of hours it takes Laura, and T is the number of hours it takes them together.

$$\frac{R_1 R_2}{R_1 + R_2} = T$$

2. Solve the equation for P_2.

$$P_1 R + \frac{P_2}{V} = d$$

3. The profit function for a company is given by $P = Rx - C_1 - C_2 x$, where P is the profit, R is the selling price of their product, C_1 is the company's fixed cost, C_2 is their variable cost, and x is the total number of products sold. What is the selling price R when $P = 114$, $C_1 = 550$, $C_2 = 3.50$, and $x = 16$?

4. Solve the equation for x_1.

$$\frac{3V}{x_1} = td_0 + 2x_2d_1$$

5. Solve the equation for Y_2 when $t_1 = 2$, $t_2 = 11$, $D = 1/3$, and $Y_1 = 25$.

$$3t_1 + \frac{15t_2D}{Y_2} = Y_1 - 5$$

6. The volume of the medium size box at the post office is given by $V = d_1 \times d_2 \times d_3$, where d_1, d_2, and d_3 are the length, width, and height, respectively. Given $d_1 = 4$ and $d_2 = 5$, find the relationship between volume and height.

WORD PROBLEMS INTO EQUATIONS

1. Write the phrase as an algebraic expression.

Six more than three times a number

2. Find the value of the expression.

The quotient of 150 and 5

3. Write the phrase as an algebraic expression.

Half of five times a number

4. Find the value of the expression.

3 less than the product of 2 and 7

5. Find the value of the expression.

$\frac{1}{3}$ of 2 more than 7

6. David's age is five more than twice Jane's age. If Jane is 6, how old is David?

CONSECUTIVE INTEGERS

1. Write the next five consecutive integers following -4.

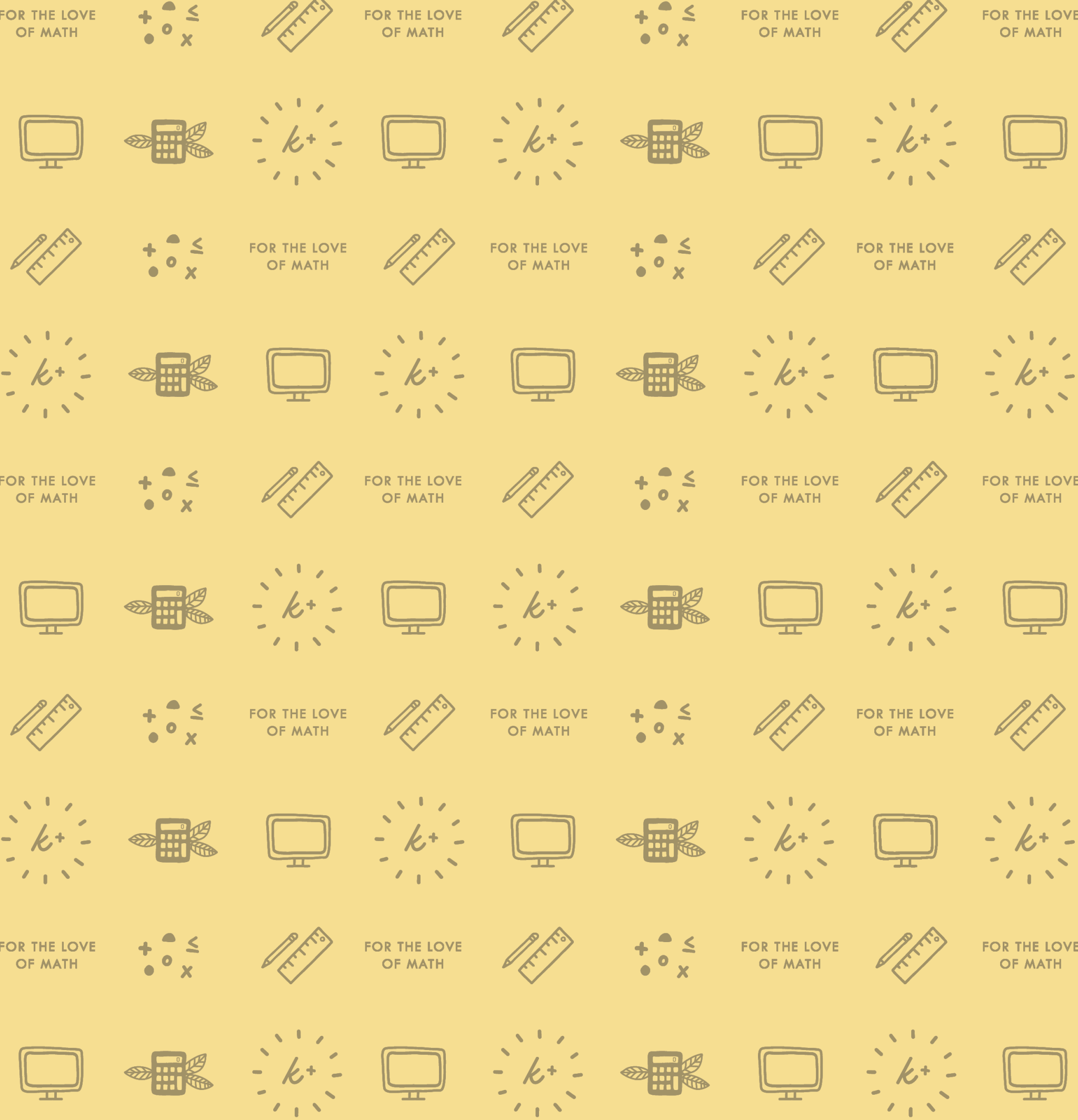
2. Give an example of three consecutive negative integers.

3. Write the four consecutive integers that precede -3.

4. Find three consecutive integers that sum to 60.

5. Find three consecutive odd integers that sum to 21.

6. If, given three consecutive integers, the third integer is 10 more than the sum of the first two integers, what is the third integer?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