

Equation Builders

Turn situations and statements into solvable equations.

HIGH SCHOOL • HSA-CED.A

CCSS.Math.Content.HSA-CED.A "Create equations that describe numbers or relationships"

NAME _____

DATE _____

BUILD THE RELATIONSHIP

Let x stand for the unknown quantity. Translate the words into math, using $=$ for an exact amount, $\geq$ for at least, and $\leq$ for at most. Solve for x , then check that your answer fits the situation.

WORKED EXAMPLE

A fundraiser earns \$11 for each item sold and pays a \$17 fee. The fundraiser has \$71 after paying the fee. How many items were sold?

1. Let x = the number of items sold.
2. Write the equation: $11x - 17 = 71$.
3. Add 17 to both sides: $11x = 88$.
4. Divide both sides by 11: $x = 8$.

Answer: 8 items

PRACTICE 6 problems

- 1** Write an equation and solve it: Three times a number plus 7 is 34.

ANSWER _____

- 2** Write an equation and solve it: A number decreased by 14 is 19.

ANSWER _____

- 3** A service club has \$18 and earns \$5 for each car washed. It needs at least \$48. Let x be the number of cars washed. Write and solve an inequality.

ANSWER _____

- 4** A rectangle has a length of $x + 3$ and a width of $x - 6$. Its perimeter is 54. Write an equation and solve for x .

ANSWER _____

- 5** Write an equation and solve it: A number is $\frac{2}{7}$ of 49.

ANSWER _____

- 6** The sum of three consecutive integers is 72. Let x be the smallest integer. Write an equation and solve for x .

ANSWER _____

APPLY IT Show your work

- 1** Your group is ordering custom team shirts. There is a \$14 design fee, and each shirt costs \$7. The group can spend exactly \$63. Let x be the number of shirts. Write and solve an equation.

WORK SPACE

ANSWER _____

- 2** A phone plan costs \$22 each month plus \$3 for each extra whole gigabyte of data. You can spend at most \$40. Let x be the number of extra gigabytes. Write and solve an inequality.

WORK SPACE

ANSWER _____

CHALLENGE One step up

CHALLENGE

At a gaming tournament, 18 raffle tickets are sold. Student tickets cost \$4, and adult tickets cost \$6. The total revenue is \$84. Let s be the number of student tickets and a be the number of adult tickets. Write a system of equations and find how many of each type were sold.

PART 1 • PRACTICE

#	PROBLEM	ANSWER
1	Write an equation and solve it: Three times a number plus 7 is 34.	$3x + 7 = 34$; $x = 9$
2	Write an equation and solve it: A number decreased by 14 is 19.	$x - 14 = 19$; $x = 33$
3	A service club has \$18 and earns \$5 for each car washed. It needs at least \$48. Let x be the number of cars washed. Write and solve an inequality.	$18 + 5x \geq 48$; $x \geq 6$
4	A rectangle has a length of $x + 3$ and a width of $x - 6$. Its perimeter is 54. Write an equation and solve for x .	$2(x + 3) + 2(x - 6) = 54$; $x = 15$
5	Write an equation and solve it: A number is $\frac{2}{7}$ of 49.	$x = (\frac{2}{7}) \cdot 49$; $x = 14$
6	The sum of three consecutive integers is 72. Let x be the smallest integer. Write an equation and solve for x .	$x + (x + 1) + (x + 2) = 72$; $x = 23$

PART 2 • APPLY IT

- $14 + 7x = 63$; $x = 7$ shirts** Subtract 14 from 63 to get 49. Divide 49 by 7, so the group can order 7 shirts.
- $22 + 3x \leq 40$; $x \leq 6$ extra gigabytes** Subtract 22 from both sides to get $3x \leq 18$. Divide by 3, so the plan allows no more than 6 extra gigabytes.

CHALLENGE

$s + a = 18$; $4s + 6a = 84$; $s = 12$ student tickets and $a = 6$ adult tickets

Accept equivalent equations and inequalities, including forms with terms rearranged. In count situations, accept only solutions that meet the stated whole-number and context conditions.