LESSON MAKER PRO

Equation Builder Lab

Turn statements and situations 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

Use x for the unknown quantity. Translate each phrase into an operation, then write an equation or inequality that shows the same relationship. Solve by undoing operations in reverse order, then check that your result fits the situation.

WORKED EXAMPLE

A tutoring app charges a one-time $13 setup fee and $6 for each session. The total cost is $43. Write and solve an equation for x, the number of sessions.

1. Let x = the number of sessions.
2. Write 6x + 13 = 43.
3. Subtract 13 from both sides: 6x = 30.
4. Divide both sides by 6: x = 5.

Answer: x = 5 sessions

PRACTICE 6 problems

1 Write and solve an equation: Eight less than twice a number is 20.

ANSWER _____

2 Write and solve an equation: One third of a number, increased by 7, is 19.

ANSWER _____

3 Write and solve an equation: Ten added to negative four times a number is negative 18.

ANSWER _____

4 Write and solve an equation: Nine times the difference of a number and 1 is 27.

ANSWER _____

5 Write and solve an equation: Two thirds of a number minus 11 is 15.

ANSWER _____

6 Write and solve an equation: Eight times a number plus 9 equals twice the number plus 33.

ANSWER _____

APPLY IT Show your work

1 You have $92 for a concert ticket and its service fee. The ticket costs $12, and the service fee is $8. Write and solve an equation for x, the number of tickets you can buy.

WORK SPACE

ANSWER _____

2 Two phone plans charge for data. Plan A costs $17 each month plus $4 per gigabyte. Plan B costs $29 each month plus $1 per gigabyte. Write and solve an equation for x, the number of gigabytes at which the plans cost the same amount.

WORK SPACE

ANSWER _____

CHALLENGE One step up

You have $35 and earn $12 for each hour you work. You need at least $119. Write an inequality for x, the number of hours worked. Then explain why you must round in one direction to find the minimum number of whole hours.

WORK SPACE AND ANSWER

ANSWER KEY

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PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Write and solve an equation: Eight less than twice a number is 20.	**2x - 8 = 20; x = 14**
2	Write and solve an equation: One third of a number, increased by 7, is 19.	**x/3 + 7 = 19; x = 36**
3	Write and solve an equation: Ten added to negative four times a number is negative 18.	**-4x + 10 = -18; x = 7**
4	Write and solve an equation: Nine times the difference of a number and 1 is 27.	**9(x - 1) = 27; x = 4**
5	Write and solve an equation: Two thirds of a number minus 11 is 15.	**(2/3)x - 11 = 15; x = 39**
6	Write and solve an equation: Eight times a number plus 9 equals twice the number plus 33.	**8x + 9 = 2x + 33; x = 4**

PART 2 · APPLY IT

1. **12x + 8 = 92; x = 7 tickets** Subtract the $8 service fee from $92 to get $84 for tickets. Divide $84 by $12.
2. **17 + 4x = 29 + x; x = 4 gigabytes** Set the two total monthly costs equal. Subtract x and 17, then divide by 3.

CHALLENGE

12x + 35 >= 119; x >= 7. The minimum is 7 whole hours because fewer than 7 hours gives less than $119.

Accept equivalent equation forms, including equations with terms reversed on both sides. For the challenge, accept x >= 7 or an equivalent inequality and an explanation that the hours must meet or exceed the minimum.