LESSON MAKER PRO

Equation Quest

Represent real situations with equations and inequalities.

GRADE 7 · 7.EE.B.4

CCSS.Math.Content.7.EE.B.4 "Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities."

NAME _____ DATE _____

CHOOSE A VARIABLE

Let x represent the unknown quantity. Use = when two amounts are equal, <= for no more than, and >= for at least. Solve by undoing operations on both sides of the equation or inequality.

WORKED EXAMPLE

Solve $4x + 7 = 31$.

1. Subtract 7 from both sides: $4x = 24$.
2. Divide both sides by 4: $x = 6$.
3. Check: $4(6) + 7 = 31$.

Answer: x = 6

PRACTICE 6 problems

1 Write an equation and solve: A number plus 9 is 22.

ANSWER _____

2 Write an equation and solve: Five times a number is 45.

ANSWER _____

3 Write an equation and solve: One third of a number, plus 8, is 13.

ANSWER _____

4 Write an equation and solve: Twenty minus three times a number is 11.

ANSWER _____

5 Write and solve an inequality: A number plus 11 is no more than 19.

ANSWER _____

6 Write and solve an inequality: A number decreased by 5 is at least 16.

ANSWER _____

APPLY IT Show your work

1 At a school esports event, a team pays $8 to enter and $3 for each controller rental. The team spends $23 altogether. Let x be the number of controller rentals. Write and solve an equation.

WORK SPACE

ANSWER _____

2 Leah is saving $28 for headphones. She already has $13 and earns $3 for each dog-walking job. Let x be the number of jobs. Write and solve an inequality to find the minimum number of jobs she needs.

WORK SPACE

ANSWER _____

CHALLENGE One step up

A gaming center charges $2 to enter and $3 for each game. Noor has $29. Let x be the number of games Noor can play. Write and solve an inequality. Then explain why 9 games work but 10 games do not.

WORK SPACE AND ANSWER

ANSWER KEY

Equation Quest

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PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Write an equation and solve: A number plus 9 is 22.	**x + 9 = 22; x = 13**
2	Write an equation and solve: Five times a number is 45.	**5x = 45; x = 9**
3	Write an equation and solve: One third of a number, plus 8, is 13.	**x/3 + 8 = 13; x = 15**
4	Write an equation and solve: Twenty minus three times a number is 11.	**20 - 3x = 11; x = 3**
5	Write and solve an inequality: A number plus 11 is no more than 19.	**x + 11 <= 19; x <= 8**
6	Write and solve an inequality: A number decreased by 5 is at least 16.	**x - 5 >= 16; x >= 21**

PART 2 · APPLY IT

1. **8 + 3x = 23; x = 5 controller rentals** Start with the fixed entry cost and add $3 for each rental: 8 + 3x = 23. Subtract 8, then divide by 3.
2. **13 + 3x >= 28; x >= 5, so Leah needs at least 5 jobs** Her starting money plus earnings must be at least $28: 13 + 3x >= 28. Subtract 13 and divide by 3, then use the next whole number.

CHALLENGE

2 + 3x <= 29; x <= 9. Nine games cost $29, but 10 games cost $32, which is more than $29.

Accept equivalent equations and inequalities with the variable on either side. For the contextual problems, accept the stated whole-number interpretation as well as the algebraic solution.