LESSON MAKER PRO

Find the Unknown

Use equations, inequalities, and diagrams to solve real problems.

GRADE 7 · MT.7.EE.4

MT.7.EE.4 "Use variables to represent quantities and construct simple equations and inequalities to solve problems in context. This standard should incorporate cultural context relating to Montana Indigenous Peoples and local communities by: Solving..."

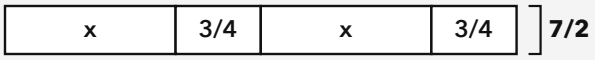
NAME _____ DATE _____

UNDO THE OPERATIONS

To solve $p \cdot x + q = r$, subtract q, then divide by p. To solve $p(x + q) = r$, divide by p, then subtract q. For an inequality with a positive number multiplying x, use the same steps and show a strict boundary with an open circle.

WORKED EXAMPLE

The tape shows two equal groups. Write an equation and find x.

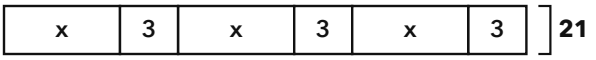


1. Write the equation: $2(x + 3/4) = 7/2$.
2. Divide by 2: $x + 3/4 = 7/4$.
3. Subtract 3/4: $x = 1$.

Answer: x = 1

PRACTICE 6 problems

1 Use the tape to write an equation and find x.



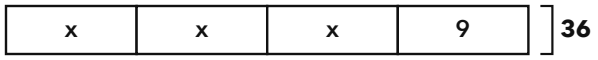
ANSWER _____

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2 Solve $5x + 6 = 46$.

ANSWER _____

3 Use the tape to write an equation and find x.



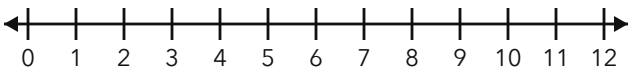
ANSWER _____

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4 Solve 4(x + 5) = 52.

ANSWER _____

5 Solve 6x + 9 > 45. Graph the solution on the number line.



ANSWER _____

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6 A poster costs $7, and each button costs $3. You have less than $25. Let x be the number of buttons. Write an inequality and find the possible numbers of buttons.

ANSWER _____

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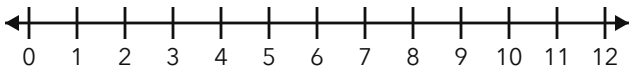
APPLY IT Show your work

1 At a Montana school, students plan a community display featuring work by local Indigenous artists. Each of 4 boards has x pieces of art and 5 information cards. The boards hold 48 pieces of art and cards in all. How many pieces of art are on each board? Write an equation and solve it.

WORK SPACE

ANSWER _____

2 At a Montana community center, students print flyers for a public talk by an Indigenous artist. Printing setup costs $4, and each flyer costs $3/2. The group can spend less than $19. Let x be the number of flyers. Write and solve an inequality. Graph its solution on the number line, then state the possible whole-number flyer counts.



ANSWER _____

CHALLENGE One step up

At a youth sports night, 5 teams each pay the same entry fee and $9 for snacks. Together they pay $100. Let x be the entry fee per team. Find x using an equation and using arithmetic. List the operations in order for each method.

WORK SPACE AND ANSWER

ANSWER KEY

Find the Unknown

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PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Use the tape to write an equation and find x.	**3(x + 3) = 21; x = 4**
2	Solve 5x + 6 = 46.	**x = 8**
3	Use the tape to write an equation and find x.	**3x + 9 = 36; x = 9**
4	Solve 4(x + 5) = 52.	**x = 8**
5	Solve 6x + 9 > 45. Graph the solution on the number line.	**x > 6; open circle at 6, arrow to the right**
6	A poster costs $7, and each button costs $3. You have less than $25. Let x be the number of buttons. Write an inequality and find the possible numbers of buttons.	**3x + 7 < 25; x can be 0, 1, 2, 3, 4, or 5**

PART 2 · APPLY IT

1. **4(x + 5) = 48; x = 7 pieces of art per board** Divide 48 by 4 to get 12 items per board. Subtract 5 information cards to get 7 pieces of art.
2. **(3/2)x + 4 < 19; x < 10. On the number line, show 0 through 9 for the possible flyer counts, with an open circle at 10. The group can print 0 through 9 flyers.** Subtract 4 from both sides, then divide by 3/2 to get x < 10. Because flyers are counted in whole numbers, the possible counts are 0 through 9.

CHALLENGE

Equation: 5(x + 9) = 100. Divide 100 by 5, then subtract 9, so x = $11. Arithmetic: multiply 5 by 9 to get $45 for snacks, subtract $45 from $100, then divide $55 by 5 to get $11.

Accept equivalent equations and inequalities. For the flyer graph, accept marked whole-number points from 0 through 9; students may also shade from 0 to an open circle at 10 if they clearly state that only whole-number counts are possible.