LESSON MAKER PRO

# Line Up Solutions

*Solve inequalities and show each solution on a number line.*

**GRADE 8 · 8.PFA.5.b**

**8.PFA.5.b** "Represent solutions to inequalities algebraically and graphically using a number line."

NAME _____ DATE _____

## SHOW THE SOLUTION

Use inverse operations to get x alone. If you multiply or divide by a negative number, reverse the inequality sign. Use an open circle for < or >, and a closed circle for <= or >=. Shade in the direction of the solutions.

## WORKED EXAMPLE

Solve and graph: 3x - 5 <= 16

1. Add 5 to both sides: 3x <= 21.
2. Divide both sides by 3: x <= 7.
3. Graph: Put a closed circle at 7 and shade left.

**Answer: x <= 7; closed circle at 7, shade left.**

## PRACTICE 6 problems

**1** Solve the inequality. Then describe the number-line graph: x + 6 > 14

**ANSWER** _____

**2** Solve the inequality. Then describe the number-line graph: 4x <= 40

**ANSWER** _____

**3** Solve the inequality. Then describe the number-line graph: 20 - 2x < 2

**ANSWER** _____

**4** Solve the inequality. Then describe the number-line graph: x/8 + 1 >= 4

**ANSWER** _____

**5** Solve the inequality. Then describe the number-line graph: -6x > 24

**ANSWER** _____

**6** Solve the inequality. Then describe the number-line graph: 2(x - 9) <= 22

**ANSWER** _____

## APPLY IT Show your work

**1** A game controller costs $42. Rina has saved $14. Let x be the number of more dollars Rina needs to save. Write and solve an inequality to show how much more she needs. Then describe the number-line graph.

WORK SPACE

**ANSWER** _____

**2** Kai has $44 to spend at an art fair. Entry costs $8, and each sticker pack costs $4. Let x be the number of sticker packs Kai can buy. Write and solve an inequality, describe the graph, and state the possible whole-number values of x.

WORK SPACE

**ANSWER** _____

## CHALLENGE One step up

**CHALLENGE**

Solve the compound inequality. Then describe the number-line graph: $-4 < 2x + 8 \leq 20$

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ANSWER KEY

# Line Up Solutions

GRADE 8 · 8.PFA.5.b

## PART 1 · PRACTICE

| # | PROBLEM | ANSWER |
|---|---|---|
| 1 | Solve the inequality. Then describe the number-line graph: x + 6 > 14 | **x > 8; open circle at 8, shade right.** |
| 2 | Solve the inequality. Then describe the number-line graph: 4x <= 40 | **x <= 10; closed circle at 10, shade left.** |
| 3 | Solve the inequality. Then describe the number-line graph: 20 - 2x < 2 | **x > 9; open circle at 9, shade right.** |
| 4 | Solve the inequality. Then describe the number-line graph: x/8 + 1 >= 4 | **x >= 24; closed circle at 24, shade right.** |
| 5 | Solve the inequality. Then describe the number-line graph: -6x > 24 | **x < -4; open circle at -4, shade left.** |
| 6 | Solve the inequality. Then describe the number-line graph: 2(x - 9) <= 22 | **x <= 20; closed circle at 20, shade left.** |

## PART 2 · APPLY IT

1. **x >= 28; closed circle at 28, shade right.** Write x + 14 >= 42 because Rina needs at least the cost of the controller. Subtract 14 from both sides.
2. **x <= 9; closed circle at 9, shade left. Possible whole-number values are 0 through 9.** Write 8 + 4x <= 44 because Kai cannot spend more than $44. Subtract 8, then divide by 4.

## CHALLENGE

**-6 < x <= 6; open circle at -6, closed circle at 6, and shade between them.**

Accept equivalent inequality notation and accurate number-line descriptions. For the sticker-pack situation, accept x <= 9 plus whole-number values from 0 through 9.