LESSON MAKER PRO

Balance or Bound

Solve equations and inequalities by keeping each side balanced.

GRADE 7 · 7.PFA.4.h

7.PFA.4.h "Describe the differences and similarities between solving linear inequalities in one variable and linear equations in one variable."

NAME _____ DATE _____

SAME MOVES, DIFFERENT ANSWERS

For both equations and inequalities, use inverse operations to isolate x. An equation usually has one solution, while an inequality has a set of solutions. Reverse the inequality sign only when you multiply or divide both sides by a negative number.

WORKED EXAMPLE

Solve: $5x - 7 > 18$

1. Add 7 to both sides: $5x > 25$.
2. Divide both sides by 5: $x > 5$.

Answer: x > 5

PRACTICE 6 problems

1 Solve: $3x + 2 = 14$

ANSWER _____

2 Solve: $4x - 1 <= 11$

ANSWER _____

3 Solve: $-2x + 9 = 1$

ANSWER _____

4 Solve: $-3x + 12 > 0$. State why the inequality sign changes or does not change.

ANSWER _____

5 Solve: $6 + x = 15$. Then state one way solving this equation is like solving an inequality.

ANSWER _____

6 A student changes $8x < 24$ to $x < 3$ by dividing both sides by 8. Is the student correct? Explain.

ANSWER _____

APPLY IT Show your work

1 You have $28 to spend on game downloads. You already bought an item for $10, and each download costs $3. Let x be the number of downloads you can buy. Write and solve an inequality to find the greatest number of downloads you can buy.

WORK SPACE

ANSWER _____

2 You and your friends buy dance tickets that cost $8 each. There is also one $3 online fee. The total cost is $35. Let x be the number of tickets. Write and solve an equation.

WORK SPACE

ANSWER _____

CHALLENGE One step up

Solve: -3(2x + 4) >= 15. Explain why the inequality sign reverses or does not reverse.

WORK SPACE AND ANSWER

ANSWER KEY

Balance or Bound

GRADE 7 · 7.PFA.4.h

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Solve: 3x + 2 = 14	**x = 4**
2	Solve: 4x - 1 <= 11	**x <= 3**
3	Solve: -2x + 9 = 1	**x = 4**
4	Solve: -3x + 12 > 0. State why the inequality sign changes or does not change.	**x < 4; dividing by -3 reverses the inequality sign.**
5	Solve: 6 + x = 15. Then state one way solving this equation is like solving an inequality.	**x = 9; both use inverse operations to isolate x.**
6	A student changes 8x < 24 to x < 3 by dividing both sides by 8. Is the student correct? Explain.	**Yes. Dividing by positive 8 does not reverse the inequality sign, so x < 3.**

PART 2 · APPLY IT

1. **10 + 3x <= 28, so x <= 6. The greatest whole number of downloads is 6.** Write 10 + 3x <= 28 because the total cannot be more than $28. Subtract 10 and divide by 3.
2. **8x + 3 = 35, so x = 4 tickets.** Subtract the $3 fee from both sides, then divide by 8.

CHALLENGE

x <= -9/2. After expanding and adding 12, divide by -6, so the inequality sign reverses.

Accept equivalent inequality forms, including solution statements written in words. For the download problem, accept x <= 6 if the student also identifies 6 as the greatest whole-number answer.