LESSON MAKER PRO

Balance It Out

Use models and inverse operations to solve for x.

GRADE 7 · 7.PFA.3.a

7.PFA.3.a "Represent and solve two-step linear equations in one variable using a variety of concrete materials and pictorial representations."

NAME _____ DATE _____

KEEP BOTH SIDES EQUAL

Think of an equation as a balanced scale. Model x with an x-tile and numbers with unit tiles, then undo the number operation first. Whatever you do to one side, do to the other side.

WORKED EXAMPLE

Solve: $2x + 5 = 19$

1. Subtract 5 from both sides: $2x = 14$.
2. Divide both sides by 2: $x = 7$.
3. Check: $2(7) + 5 = 19$.

Answer: x = 7

PRACTICE 6 problems

1 Tile balance: [x] [x] [x] + 4 unit tiles balances 22 unit tiles. Write an equation and solve.

ANSWER _____

2 Solve: $4x - 8 = 16$

ANSWER _____

3 Bar model: One of 3 equal parts of a bar labeled x, plus 9, is 15. Write an equation and solve.

ANSWER _____

4 Solve: $6x - 1 = 23$

ANSWER _____

5 Solve: $x/6 + 1 = 4$

ANSWER _____

6 Solve: $9x - 1 = 35$

ANSWER _____

APPLY IT Show your work

1 An arcade card costs $11 to activate. Each game costs $3. Mia spends $35 total. How many games does she play?

WORK SPACE

ANSWER _____

2 A skate park pass has a $14 registration fee and costs $8 for each visit. Jay pays $46 total. How many visits does he make?

WORK SPACE

ANSWER _____

CHALLENGE One step up

Solve and explain your reasoning: 4x - 12 = 3x + 6

WORK SPACE AND ANSWER

ANSWER KEY

Balance It Out

GRADE 7 · 7.PFA.3.a

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Tile balance: [x] [x] [x] + 4 unit tiles balances 22 unit tiles. Write an equation and solve.	**3x + 4 = 22; x = 6**
2	Solve: 4x - 8 = 16	**x=6**
3	Bar model: One of 3 equal parts of a bar labeled x, plus 9, is 15. Write an equation and solve.	**x/3 + 9 = 15; x = 18**
4	Solve: 6x - 1 = 23	**x=4**
5	Solve: x/6 + 1 = 4	**x = 18**
6	Solve: 9x - 1 = 35	**x=4**

PART 2 · APPLY IT

1. **8 games** Write 3x + 11 = 35. Subtract 11, then divide by 3 to get x = 8.
2. **4 visits** Write 8x + 14 = 46. Subtract 14, then divide by 8 to get x = 4.

CHALLENGE

x = 18; subtract 3x from both sides to get x - 12 = 6, then add 12 to both sides.

Accept equivalent equations written from the tile and bar models. Students may use any valid inverse-operation order that keeps both sides of each equation equal.