LESSON MAKER PRO

Letter Coefficient Quest

Solve equations and inequalities with letter coefficients.

GRADE 8 · 8.PAR.3.5

8.PAR.3.5 "Solve linear equations and inequalities in one variable with coefficients represented by letters and explain the solution based on the contextual, mathematical situation."

NAME _____ DATE _____

PRACTICE: SOLVE IT

A letter coefficient stands for a number, so use inverse operations to isolate x. You may divide by a letter coefficient only when it is not zero. When you multiply or divide an inequality by a negative number, reverse the inequality sign.

WORKED EXAMPLE

Assume m != 0. Solve: 5mx - 2m = 13m

1. Add 2m to both sides.
2. 5mx = 15m
3. Divide both sides by 5m. x = 3

Answer: x = 3

PRACTICE 6 problems

1 Assume a != 0. Solve: a(x + 7) = 8a

ANSWER _____

2 Assume b != 0. Solve: 9bx - b = 8b

ANSWER _____

3 Assume d != 0. Solve: d(x + 6) = 10d

ANSWER _____

4 Assume q != 0. Solve: 6qx = 24q

ANSWER _____

5 Assume r > 0. Solve: -r(x - 7) > 11r

ANSWER _____

6 Assume s > 0. Solve: s(x - 1) <= -7s

ANSWER _____

APPLY IT Show your work

1 At a game tournament, each win is worth p points. A sponsor gives the team a bonus of 6p points. The team needs 14p points total, and p > 0. Let x be the number of wins. Write and solve an equation. What does x mean in this situation?

WORK SPACE

ANSWER _____

2 A student club sells phone cases. Each case brings in k dollars, and the club has a design cost of 9k dollars. The club wants a net gain of at least 21k dollars, where k > 0. Let x be the number of cases sold. Write and solve an inequality. State the least whole number of cases the club must sell.

WORK SPACE

ANSWER _____

CHALLENGE One step up

Assume h != 0. Solve h(x - 4) <= 12h. Explain how the solution changes when h > 0 and when h < 0.

WORK SPACE AND ANSWER

ANSWER KEY # Letter Coefficient Quest

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Assume a != 0. Solve: a(x + 7) = 8a	**x = 1**
2	Assume b != 0. Solve: 9bx - b = 8b	**x = 1**
3	Assume d != 0. Solve: d(x + 6) = 10d	**x = 4**
4	Assume q != 0. Solve: 6qx = 24q	**x = 4**
5	Assume r > 0. Solve: -r(x - 7) > 11r	**x < -4**
6	Assume s > 0. Solve: s(x - 1) <= -7s	**x <= -6**

PART 2 · APPLY IT

1. **px + 6p = 14p; x = 8. The team needs 8 wins.** Subtract 6p from both sides to get px = 8p. Divide by p, which is positive, so x = 8.
2. **kx - 9k >= 21k; x >= 30. The club must sell at least 30 cases.** Add 9k to both sides to get kx >= 30k. Divide by positive k to get x >= 30.

CHALLENGE

If h > 0, x <= 16. If h < 0, x >= 16.

Accept equivalent equation and inequality forms. For the contextual items, accept clear statements that x represents wins or cases, and require the whole-number interpretation for the phone-case problem.