Writing Equations and Inequalities Worksheet

Algebra 1 · Common Core HSA-CED.A.1

> Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions.

Practice

Builds the skill step by step.

1. Jaylen has 45 dollars and saves 15 dollars each week. Which equation finds the number of weeks w until he has 150 dollars?

   A. $15 + 45w = 150$

   B. $45 - 15w = 150$

   C. $45 + 15w = 150$

   D. $15w = 150 + 45$

2. Solve the equation from the last problem. How many weeks will it take Jaylen to have 150 dollars?

3. A gym charges a 25 dollar sign-up fee and 30 dollars per month. Mia has paid 205 dollars in all. Write an equation and solve it to find how many months she has been a member.

4. A rideshare costs 4 dollars plus 2 dollars per mile. Leo can spend at most 20 dollars. Which inequality shows the miles m he can ride?

   A. $4 + 2m \geq 20$

   B. $2 + 4m \leq 20$

   C. $2 + 4m \geq 20$

   D. $4 + 2m \leq 20$

5. Use the inequality from the last problem. What is the greatest whole number of miles Leo can ride?

6. The sum of three consecutive integers is 72. Write and solve an equation to find the smallest of the three integers.

7. A rectangle's length is 3 cm more than its width. Its perimeter is 46 cm. Write and solve an equation to find the width.

8. Tickets to the school play cost 8 dollars each. The club needs to raise at least 500 dollars. Write an inequality and find the fewest tickets the club must sell.

9. A square patio has an area of 81 square feet. Write and solve an equation to find the length of one side.

10. When a number is doubled and then increased by 7, the result is 31. Write and solve an equation to find the number.

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On Level

Grade-level practice.

1. Gym A charges 20 dollars a month plus 5 dollars per class. Gym B charges 50 dollars a month plus 2 dollars per class. Write and solve an equation to find the number of classes in a month for which the two gyms cost the same.

2. Use the two gyms from the last problem. Write an inequality to show when Gym B costs less than Gym A. For more than how many classes a month is Gym B cheaper?

3. A rectangular rug is 4 feet longer than it is wide. Its area is 96 square feet. Write and solve an equation to find the width of the rug.

4. A town has 5,000 people, and its population doubles every 10 years. Write and solve an equation to find how many years it takes the town to reach 40,000 people.

5. Maya can paint a fence in 6 hours. Leo can paint the same fence in 3 hours. Write and solve an equation to find how long it takes them working together.

6. Bottled water costs 1.25 dollars a bottle. A club has 40 dollars and must keep at least 10 dollars for ice. Which inequality shows the number of bottles b the club can buy?

   A. $1.25b - 10 \leq 40$

   B. $1.25b + 10 \leq 40$

   C. $1.25b + 10 \geq 40$

   D. $40 - 1.25b \leq 10$

7. Use the inequality from the last problem. What is the greatest number of bottles the club can buy?

8. Ravi's test scores are 82, 90 and 75. Write and solve an equation to find the score he needs on his fourth test to have a mean of exactly 85.

9. The product of two consecutive positive even integers is 168. Write and solve an equation to find the smaller integer.

10. A car rental costs 35 dollars a day plus 0.20 dollars per mile. Dana rents a car for 3 days and has 150 dollars to spend. Write an inequality and find the most miles she can drive.

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Challenge

Multi-step and word problems that stretch it.

1. A car is worth 24,000 dollars and loses half its value every 4 years. Write and solve an equation to find when the car is worth 3,000 dollars.

2. A boat travels 24 miles downstream and then 24 miles back upstream. In still water the boat goes 10 miles per hour, and the round trip takes 5 hours. Write and solve an equation to find the speed of the current.

3. A garden is 10 m by 6 m. A path of the same width x goes all the way around it. The garden and path together cover 96 m^2. Write and solve an equation to find the width of the path.

4. A taxi charges 5 dollars plus 3 dollars per mile, and Ana can spend no more than 50 dollars. Sam models this with $5 + 3x \geq 50$. What is wrong with Sam's inequality?

   A. Nothing is wrong with it.

   B. The sign should be $\leq$, because Ana's cost can't go above 50 dollars.

   C. It should be an equation, not an inequality.

   D. The 5 and the 3 should switch places.

5. The square of a positive number is 12 more than the number. Write and solve an equation to find the number.

6. A pitcher holds 10 liters of drink that is 30% juice. How many liters of water must be added so the drink is 20% juice? Write and solve an equation.

7. Kiara has 60 dollars and spends 4 dollars on lunch each day. Ben has 20 dollars and saves 4 dollars each day. Write an inequality to find when Ben has more money than Kiara. On which day does Ben first have more money than Kiara?

8. A bacteria culture starts with 200 cells and triples every hour. Write and solve an equation to find how many hours it takes to reach 5,400 cells.

9. A rectangle's length is twice its width. If the width grows by 3 units and the length shrinks by 2 units, the area goes up by 30 square units. Write and solve an equation to find the original width.

10. A coach solves $n^2 - 5n = 24$ to find the number of players n on a team and gets $n = 8$ or $n = -3$. What is the best conclusion?

    A. The team has -3 players.

    B. The team has 8 or -3 players, so both answers work.

    C. Neither answer makes sense, so the equation is wrong.

    D. The team has 8 players, because a number of players can't be negative.