LESSON MAKER PRO

Equation Builder

Turn relationships into equations, then solve.

HIGH SCHOOL · HSA-CED.A.1

CCSS.Math.Content.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."

NAME _____ DATE _____

BUILD THEN SOLVE

Translate each relationship into an equation or inequality using x for the unknown amount. Keep both sides balanced as you solve, and reverse an inequality sign when you multiply or divide by a negative number.

WORKED EXAMPLE

Solve $13(x - 9) = 52$.

1. Divide both sides by 13: $x - 9 = 4$.
2. Add 9 to both sides: $x = 13$.

Answer: x = 13

PRACTICE 6 problems

1 Seven more than five times x is 32. Write an equation and solve it.

ANSWER _____

2 Solve $x^2 - 17x + 70 = 0$.

ANSWER _____

3 Solve $12/x = 6$.

ANSWER _____

4 Solve $6^x = 36$.

ANSWER _____

5 Eleven minus twice x is less than 1. Write an inequality and solve it.

ANSWER _____

6 Solve $(x + 2)/6 = 5$.

ANSWER _____

APPLY IT Show your work

1 A music streaming service charges a $5 sign-up fee and $11 per month. You have $71 to spend. Write and solve an equation to find how many months you can pay for exactly.

WORK SPACE

ANSWER _____

2 In a skateboarding video, the height of a tossed ball after t seconds is modeled by $h = -3t^2 + 21t$. Write an equation for when the ball is on the ground, then find when it hits the ground after release.

WORK SPACE

ANSWER _____

CHALLENGE One step up

A club post is shared 6 times on day zero, and the number of shares triples each day. The model is $S = 6(3^x)$, where x is the number of days. Write and solve an inequality to find the least whole number of days needed for at least 1458 shares. Explain how you know your answer is the least number of days.

WORK SPACE AND ANSWER

Equation Builder

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Seven more than five times x is 32. Write an equation and solve it.	**5x + 7 = 32; x = 5**
2	Solve x^2 - 17x + 70 = 0.	**x = 7 or x = 10**
3	Solve 12/x = 6.	**x = 2**
4	Solve 6^x = 36.	**x = 2**
5	Eleven minus twice x is less than 1. Write an inequality and solve it.	**11 - 2x < 1; x > 5**
6	Solve (x + 2)/6 = 5.	**x = 28**

PART 2 · APPLY IT

1. **11x + 5 = 71; x = 6 months** Let x be the number of months. Subtract the sign-up fee, then divide the remaining cost by the monthly charge.
2. **$-3t^2 + 21t = 0$; t = 7 seconds** Set h equal to zero and factor t(-3t + 21) = 0. The solution t = 0 is the release time, so the later solution is 7 seconds.

CHALLENGE

$6(3^x) >= 1458$; x >= 5. At x = 5, S = 1458, and at x = 4, S = 486, so 5 is the least whole number of days.

Accept equivalent equation and inequality forms. For the quadratic word problem, accept both roots during algebra work, but the contextual answer is 7 seconds because t = 0 is the release time.