Solving Multi-Step Equations: Homework Practice

Part 2: Guided Process

Let's walk through a multi-step equation: **3(x - 2) + 4 = 19**

Fill in the missing math for each step.

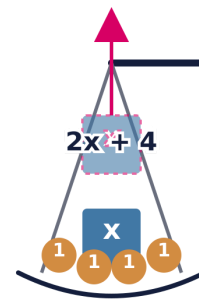| Step Description	The Math
1. Distribute to remove brackets. *(Multiply 3 by x and 3 by -2)*	3x - 6 + 4 = 19
2. Combine Like Terms. *(Combine -6 and +4)*	3x - 2 = 19
3. Isolate the variable term. *(Add 2 to both sides)*	
4. Solve for x. *(Divide by 3)*	x =

Checkpoint: Strategy Selection 💡

Before you move on to solving problems on your own, let's review the common strategies we use for multi-step equations. Match the algebraic situation on the left with the correct first step on the right.

If you see this in the equation…	Use this strategy!
1. Brackets or parentheses like **4(x + 2)**	
2. Two numbers on the same side like **5x + 3 + 2 = 15**	

3. Variables on both sides like **4x = 2x + 10**

SUBTRACT x FROM BO

2x + 4

x

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Keep the scale balan

💡 **Goal of Every Step:** No matter which strategy you start with, the goal is always the same: isolate the variable (get **x** all by itself) by using inverse operations!

Word bank: distributive, isolate, balance, inverse

1. To remove brackets from an equation, we use the _____ property.
2. We use _____ operations, like subtraction to undo addition, to solve for x.
3. Whatever operation you do to one side of the equation, you must do to the other to maintain _____.

Part 3: Independent Practice ✏️

Solve the equations below. Be careful with negatives! Check your answers by plugging them back into the original equation.

1. **In the equation 2x + 5 = 15, what is the first step?**	a) Divide by 2 b) Subtract 5 from both sides c) Add 5 to both sides d) Add 2 to both sides

2. **When solving 5x = 2x + 12, what is the best first step?**	a) Divide everything by 5 b) Subtract 12 from both sides c) Subtract 2x from both sides d) Add 2x to both sides

Solve the following equations showing your work:

A) Variables on one side

$4a - 3 = 13$

B) With Brackets

$2(m + 4) = 18$

C) Variables on both sides

$6y + 2 = 3y + 14$

D) Challenge

$-2(x - 3) = 4x + 12$

Part 4: Error Analysis & Application 🕵️‍♀️

A student tried to solve **3(x + 4) = 24** but got the wrong answer.

Their work:
$3x + 4 = 24$
$3x = 20$
$x = 6.66...$

1. Identify the mistake and explain it:

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2. Correct Solution: Solve the equation $3(x + 4) = 24$ properly below.

A local hockey rink charges a $50 fee to rent the ice, plus $15 per player. The total bill for the party came to $230. Write an equation and solve it to find out how many players attended.

Answer Key

Part 2: Guided Process

Step 3: 3x = 21
Step 4: x = 7

Checkpoint: Strategy Selection 💡

Gap Fills:
1. To remove brackets from an equation, we use the **distributive** property.
2. We use **inverse** operations, like subtraction to undo addition, to solve for x.
3. Whatever operation you do to one side of the equation, you must do to the other to maintain **balance**.

Part 3: Independent Practice ✏️

Multiple Choice:
1. Subtract 5 from both sides
2. Subtract 2x from both sides

Answer:
$4a = 16, a = 4$

Answer:
$3y = 12, y = 4$

Answer:
$2m + 8 = 18, 2m = 10, m = 5$

Answer:
$-2x + 6 = 4x + 12 \rightarrow -6x = 6 \rightarrow x = -1$

Part 4: Error Analysis & Application 🕵️

Answer:
They did not distribute the 3 to the 4. It should be 3x + 12.

Answer:
$3x + 12 = 24, 3x = 12, x = 4$

Answer:
$15p + 50 = 230. 15p = 180. p = 12.$ Answer: 12 players.