2-5 Solve Multistep Equations

Name _____ Date _____

Solve: $5c + 6 = 2c + 15$

$5c - 2c + 6 = 2c - 2c + 15$ ← Subtract $2c$

$3c + 6 = 15$

$3c + 6 - 6 = 15 - 6$ ← Undo the addition.

$3c = 9$

$\frac{3c}{3} = \frac{9}{3}$ ← Undo the multiplication.

$c = 3$

Check: $5c + 6 = 2c + 15$

$5(\mathbf{3}) + 6 \stackrel{?}{=} 2(\mathbf{3}) + 15$ ← Substitute 3 for c in the original equation.

$\mathbf{15} + 6 \stackrel{?}{=} 6 + \mathbf{15}$ ← Work each side separately.

$21 = 21$ **True**

Solution set: $\{3\}$

Solve: $5(6n - 2) = 8n + 1$

$5(6n) + 5(-2) = 8n + 1$ ← Use the Distributive Property.

$30n - 10 = 8n + 1$ ← Move the variable to one side.

$30n - 8n - 10 = 8n - 8n + 1$ ← Subtract $8n$ from both sides.

$22n - 10 = 1$

$22n - 10 + 10 = 1 + 10$ ← Undo the subtraction.

$22n = 11$

$\frac{22n}{22} = \frac{11}{22}$ ← Undo the division.

$n = \frac{1}{2}$

Check: $5(6n - 2) = 8n + 1$

$5[6(\frac{1}{2}) - 2] \stackrel{?}{=} 8(\frac{1}{2}) + 1$ ← Substitute $\frac{1}{2}$ for n in the original equation.

$5(3 - 2) \stackrel{?}{=} 4 + 1$ ← Work each side separately.

$5 = 5$ **True**

Solution set: $\{\frac{1}{2}\}$

Solve each equation. Then check your answer. Write your solution.

1. $3f - 2 = f + 8$

$\mathbf{2f = 10}$

$\mathbf{\frac{2f}{2} = \frac{10}{2}}$

$\mathbf{f = 5}$

Check: $\mathbf{3f - 2 = f + 8}$

$\mathbf{3(5) - 2 \stackrel{?}{=} (5) + 8}$

13 = 13 True

{5}

2. $5a - 3 = 2a + 12$

3. $8b + 6 = 3b + 36$

4. $11d + 7 = 8d + 10$

5. $-10 + 9b = -2b + 12$

6. $-17 + 6m = -3m + 10$

7. $2(3x - 4) = 12 + 2x$

8. $3h - 12 = 2(5h + 1)$

9. $\frac{3}{4}(8a + 20) = 6a + 10$

10. $5.4n + 4.8 = 3(1.8n + 1.6)$

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Write and solve an equation for each problem.

11. John is 10 years older than Chris. In two years, John will be twice as old as Chris. How old are they now?

12. A number tripled and then decreased by 5 equals 5 more than double the number. What is the number?

13. The sum of a number and two-thirds the number is the same as 4 less than twice the number. What is the number?

14. The product of 5 and 2 less than triple a number equals the product of 7 and 8 more than twice the number. What is the number?

15. Geometry If the side of a square is doubled and then increased by 7, the new perimeter is 8 more than 3 times the old perimeter. What is the side length of the original square? (*Hint:* Perimeter $_{\text{square}} = 4s$)

16. Geometry Audrey draws a triangle that has these sides: s, $\frac{1}{2}s$, and $\frac{2}{3}s$. When the length of s is doubled, the new perimeter is twice the old perimeter less 14. What are lengths of the triangle?

Problem Solving

17. Oscar and Amy rent a car for 5 days for $29.95 per day and $0.10 per mile. Oscar has $250 and Amy has half that amount to spend on the car. They will drive the same number of miles each day. What is the greatest number of miles they can drive each day?

18. Rectangle R's perimeter remains 180 feet when the length is halved and the width is doubled. What are the dimensions of rectangle R? (*Hint:* Perimeter $_{\text{rectangle}} = 2(\ell + w)$)

CHALLENGE

19. Joy shared part of a full bag of candy. Costas got $\frac{1}{2}$ of the candy. Lily got $\frac{1}{2}$ of what was left. Mali got $\frac{1}{3}$ of the remainder. Mali got 10 pieces. How many pieces were in the full bag?

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