Introduction to Equations and Solutions

Algebra 1 •Section 1.4

Name: _____	Date: _____	Score: _____ / 12

Quick Review and Helpful Hints

Algebra becomes easier when every symbol has a job. Read the operation first, keep signs attached to their terms, and check that each step still means the same thing as the original expression.

▷ **Example:** Simplify $2(x+6)+3x$.
Work: Distribute first: $2(x+6)=2x+12$. Then combine like terms: $2x+12+3x=5x+12$.

★ **Answer:** $5x+12$

Practice Problems

Solve each problem. Show enough work that another student could follow your thinking.

1. Is $x=6$ a solution of $x+9=15$?

_____

2. Is $a=4$ a solution of $3a-2=14$?

_____

3. Write an equation: a number plus 11 is 27.

_____

4. Write an equation: four times a number is 52.

_____

5. Is $y=3$ a solution of $5(y+1)=20$?

_____

6. Is $m=8$ a solution of $\frac{m}{2}+3=6$?

_____

7. Write an equation: 7 less than a number is 18.

_____

8. Write an equation: half a number equals 13.

_____

9. Is $r=5$ a solution of $2r+4=r+9$?

_____

10. Write an equation: the total of x and $x+4$ is 30.

_____

Word Problems

11. A streaming plan costs $\$9$ plus $\$2$ per movie. Write an equation for a $\$23$ bill.

_____

12. Sam says $x=4$ solves $6x-5=20$. Is Sam correct?

_____

Answer Keys

1. Yes
2. No
3. $n + 11 = 27$
4. $4n = 52$
5. Yes
6. No
7. $n - 7 = 18$
8. $\frac{n}{2} = 13$
9. Yes
10. $x + (x + 4) = 30$
11. $9 + 2m = 23$
12. No

Step-by-Step Explanations

1. A solution is just a value that makes the equation honest. Try 6: $6 + 9$ really is 15, so yes.

2. Test it by plugging in: $3(4) - 2$ comes out to 10, but we wanted 14 — so 4 doesn't fit.

3. Give the mystery number a name like n. 'Plus 11' becomes $+11$ and 'is' is your equals sign.

4. 'Four times a number' means 4 multiplied by n, and the little word 'is' quietly means equals.

5. Substitute and follow the order: $3+1 = 4$ inside, then $5(4) = 20$. It matches, so 3 works.

6. Pop in 8: half of 8 is 4, plus 3 makes 7. That's not 6, so 8 isn't the answer.

7. '7 less than a number' means you start with n and take 7 away — so $n - 7$, set equal to 18.

8. Half of something is that thing cut in two, which is dividing by 2. So n over 2 equals 13.

9. With $r = 5$, both sides need to agree: the left gives 14 and the right also gives 14, so it checks out.

10. 'Total of' is your cue to add the two expressions together, then set that sum equal to 30.

11. The $\$9$ shows up no matter what, while $2m$ grows with each movie. Together they have to total the $\$23$ bill.

12. Always verify a claimed solution. Here $6(4) - 5 = 19$, not 20 — and a real solution has to make both sides match exactly.

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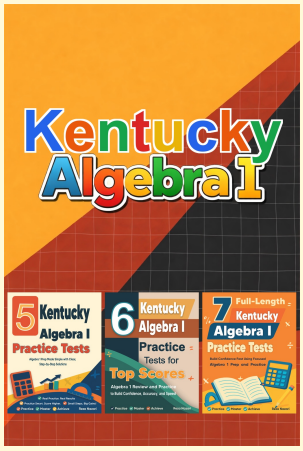

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