2-1 Open Sentences and Solution Sets

Name _____ Date _____

Using the replacement set $\{-1, 0, 1\}$, find the solution set for the open sentence $|2g + 3| = 4$.

Remember: *Open sentences* contain variables; they are neither true nor false. *Closed sentences* contain no variables; they are either true or false.

$\|2g + 3\| = 4$ Replacement set: $\{-1, 0, 1\}$	$\|2(\mathbf{-1}) + 3\| \stackrel{?}{=} 4$ $\|\mathbf{-2} + 3\| \stackrel{?}{=} 4$ $1 = 4$ **False**	$\|2(\mathbf{0}) + 3\| \stackrel{?}{=} 4$ $\|\mathbf{0} + 3\| \stackrel{?}{=} 4$ $3 = 4$ **False**	$\|2(\mathbf{1}) + 3\| \stackrel{?}{=} 4$ $\|\mathbf{2} + 3\| \stackrel{?}{=} 4$ $5 = 4$ **False**

Because each number in the set does not make the open sentence true, each number is not in the solution set. So the solution set is $\varnothing$.

Identify each as an *open sentence*, a *true sentence*, a *false sentence*, or an *expression*.

1. $11b$ _____

2. $12 + d$ _____

3. $t + 7.5 = 11.3$ _____

4. $5y - 13 = -8$ _____

5. $3(5) = 2^3 + 7$ _____

6. $7(11) = 3^3 + 40$ _____

7. $29 - 12 \div 4 = \sqrt{16}$ _____

8. $4^2 - |-9| = 7^2 \div 7$ _____

Using the replacement set $\{-2, 2\}$, find the solution set for each open sentence.

9. $3x + 1 = 7$

$3(-2) + 1 \stackrel{?}{=} 7$ $-6 + 1 \stackrel{?}{=} 7$ $-5 = 7$ False	$3(2) + 1 \stackrel{?}{=} 7$ $6 + 1 \stackrel{?}{=} 7$ $7 = 7$ True

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10. $2w - 6 = 4$ _____

11. $2b - 3 = -7$ _____

12. $11 = 4b - 1$ _____

13. $-9 = 13b - 8$ _____

14. $9 = 2y + 5$ _____

15. $3n - 4 = -6$ _____

16. $-5 = 3p + 2$ _____

Using the replacement set {−3, −2, 0, 1, 4}, find the solution set for each open sentence.

17. $5k + 1 = 21$

$5(-3) + 1 \stackrel{?}{=} 21$
$-14 = 21$ False
$5(0) + 1 \stackrel{?}{=} 21$
$1 = 21$ False
$5(4) + 1 \stackrel{?}{=} 21$
$21 = 21$ True

$5(-2) + 1 \stackrel{?}{=} 21$
$-9 = 21$ False
$5(1) + 1 \stackrel{?}{=} 21$
$6 = 21$ False

{4}

18. $7q - 2 = -16$

19. $-1 = 2m^2 - 3$

20. $3 = 11 - 2n^2$

21. $3j + 9.2 = 5.3j$

22. $5.8 - 2\ell = 3.8\ell$

Problem Solving

23. Lois runs 1 mile in 12 minutes. She runs no more than 6 miles each day. Write an algebraic expression to model how many minutes she runs each day. Tell what the variable represents, and write a domain set for that variable.

24. If the set of real numbers is the replacement set, what is the solution set for the open sentence $|5x + 11| = -8$? Explain.

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25. $29 + 38 + 51$

26. $25(11 \bullet 4)$

27. $24(23)$

28. $38(40)$