

Challenge: Skills and Applications

For use with pages 353–358

In Exercises 1–2, solve the equation.

1. $|x - 3| = \frac{x}{4}$

2. $|5 - x| = x$

3. For what real numbers
- x
- is it true that
- $|x| = x$
- ? For what real numbers
- x
- is
- $|x| = -x$
- ?

In Exercises 4–6, solve the inequality.

4. $|x + 7| = x + 7$

5. $|n - 3| > n - 3$

6. $|4 - b| < 4 - b$

In Exercises 7–10, find the solution. Indicate if an equation is an identity or there is no solution.

7. $|5x| = 5|x|$

8. $|x + 3| = |x| + 3$

9. $|x| - 1 = |x| + 1$

10. $|x| + |-x| = 8$

In Exercises 11–14, use the following information.

Greg Jones is driving on a straight road that passes through the town of Westview. In Westview there is a radio station that can be heard anywhere within a 20-mile radius of the town. Greg started 50 miles away from Westview at noon, and he is driving at a rate of 40 miles/hour towards it.

11. Write an inequality, valid for the time before Greg reaches Westview, that states that his distance from Westview, expressed as a function of his driving time t (in hours), is less than or equal to 20 miles.
12. Write an inequality corresponding to the one from Exercise 11 for the time after Greg passes through Westview.
13. Combine the inequalities from Exercises 11 and 12 into one inequality using absolute value.
14. Solve the inequality from Exercises 13. Then find the time interval during which Greg will be able to hear the Westview radio station on his car radio.