37. SOLVING AN EQUATION Interpreted geometrically, the equation $|x - a| = b$ means that the distance between x and a on a number line is b. Solve $|x - 3| = 7$ both geometrically and algebraically. *Compare* your solutions.

TRANSLATING SENTENCES **In Exercises 38 and 39, write the verbal sentence as an absolute value equation. Then solve the equation.**

38. Four more than the absolute deviation of x from 3 is 8.

39. Five times the absolute deviation of $2x$ from -9 is 15.

40. REASONING Is $a|x|$ equivalent to $|ax|$ when a is positive? when a is negative? when a is 0? Give examples to support your answers.

41. CHALLENGE How many solutions does the equation $a|x + b| + c = d$ have if $a > 0$ and $c = d$? if $a < 0$ and $c > d$?

PROBLEM SOLVING

42. GUARDRAILS A safety regulation requires that the height of a guardrail be 42 inches with an absolute deviation of 3 inches. Find the minimum and maximum heights of a guardrail.

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43. CHEERLEADING A cheerleading team is preparing a dance program for a competition. The program must last 4 minutes with an absolute deviation of 5 seconds. Find the least and greatest possible times (in seconds) that the program can last.

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44. TAKS REASONING The diameter of a billiard ball must be 2.25 inches with an absolute error of 0.005 inch. What is the maximum possible diameter that a billiard ball can have?

(A) 2.2 inches   **(B)** 2.245 inches   **(C)** 2.255 inches   **(D)** 2.3 inches

45. SPORTS In gymnastics meets last year, the mean of your friend's least and greatest scores was 54.675 points. The absolute deviation of his least and greatest scores from the mean was 2.213 points.

a. What were the least and greatest scores that he earned?

b. This year the mean of his least and greatest scores is 56.738 points, and the absolute deviation of the least and greatest scores from the mean is 0.45 point. How many points more than last year's greatest score is this year's greatest score?

46. JEWELRY A jewelry store advertisement states that a certain diamond bracelet weighs 12 carats, but the actual weight can vary by as much as 5% of the advertised weight. Find the minimum and maximum possible weights of the bracelet.

○ = **WORKED-OUT SOLUTIONS**
   on p. WS1

= **TAKS PRACTICE AND REASONING**