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Module 6 Solving Absolute Value Equations and Inequalities

Lesson 5 Solving Problems Using Absolute Value Equations and Inequalities



**additional
practice**

Write an absolute value equation or inequality to model the given situation, then solve.

1. A teacher told her student that his test score varied by less than 8 points from the score on his last test. What is the range of possible test scores if the student scored an 82 on his last test?

$$|x - 82| < 8$$

The test score is greater than 74 but less than 90.

2. In a football game, a pass is completed less than 3 yards away from the 40-yard line. What is the range of possible placements for the ball?

$$|x - 40| < 3$$

The ball is somewhere between the 37 and 43-yard lines.

3. A food warmer is set to keep food at a temperature of 175°F. The warmer's manufacturer claims it is off by at most 4.5°F. What is the range of possible temperatures?

$$|x - 175| \leq 4.5$$

The food is kept at a temperature from 170.5°F to 179.5°F.

4. To play in a certain bowling league, players must be no more than 6 years from their 30th birthday. What is the range of possible ages?

$$|x - 30| \leq 6$$

Players qualify from their 24th birthdays to their 36th birthdays.

5. A survey of residents found that 48% were homeowners. What are the maximum and minimum possible true percentages if the survey's margin of error is 5.5%?

$$|x - 48| = 5.5$$

Maximum: 53.5%; Minimum: 42.5%

6. The census of a small town found that 23% of its residents classify themselves as Native American. What are the maximum and minimum possible true percentages if the survey's margin of error is 3%?

$$|x - 23| = 3$$

Maximum: 26%; Minimum: 20%

7. A survey with a 5% margin of error shows that 82% of 10th graders plan to return to the same school for 11th grade. What is the maximum possible actual percent planning to return?

$$|x - 82| = 5$$

Maximum: 87%

9. A television meteorologist offers a prize to viewers if his forecast of the daily high temperature is off by more than 4°F. What actual high temperatures will result in a prize being given if today's forecasted high temperature was 77°F?

$$|x - 77| > 4$$

Temperatures higher than 81°F or lower than 73°F will result in a prize being given.

11. The manager of a telephone help line wants his employees to assist an average of 10 callers per hour. If an employee deviates from the goal by at least three callers, he receives additional training. What is the range of number of callers assisted resulting in additional training?

$$|x - 10| \geq 3$$

An employee assisting 7 or fewer, or 13 or more, callers per hour receives additional training.

8. A political poll showed that 26% of voters plan to vote for an independent candidate. What is the minimum possible actual percent planning to vote for the independent candidate if the poll had a margin of error of 11%?

$$|x - 26| = 11$$

Minimum: 15%

10. A personal trainer tells her clients to aim for a Body Mass Index (BMI) of no more than 3 units away from 22. What are the possible BMIs for a client who has not yet reached that goal?

$$|x - 22| > 3$$

BMIs under 19 or over 25

12. A blood pressure machine sounds an alarm if a patient's systolic blood pressure is more than 30 mm Hg (millimeters of mercury) from the ideal of 130 mm Hg. What blood pressures cause the alarm to sound?

$$|x - 130| > 30$$

Pressures over 160 mm Hg and under 100 mm Hg cause the alarm to sound.