

**REASONING** Tell whether the statement is *true* or *false*. If it is false, give a counterexample.

29. If  $a$  is a solution of  $|x + 3| \leq 8$ , then  $a$  is also a solution of  $x + 3 \geq -8$ .
30. If  $a$  is a solution of  $|x + 3| > 8$ , then  $a$  is also a solution of  $x + 3 > 8$ .
31. If  $a$  is a solution of  $|x + 3| \geq 8$ , then  $a$  is also a solution of  $x + 3 \leq -8$ .
32. If  $a$  is a solution of  $x + 3 \leq -8$ , then  $a$  is also a solution of  $|x + 3| \geq 8$ .
33. **CHALLENGE** Solve  $|x - 3| < 4$  and  $|x + 2| > 8$ . Describe your steps.
34. **CHALLENGE** If  $|ax + b| < c$  where  $c < 0$ , what is the solution of the inequality? If  $|ax + b| > c$  where  $c < 0$ , what is the solution of the inequality? Explain your answers.

## PROBLEM SOLVING

### EXAMPLE 4

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for Exs. 35–38

35. **ESSAY CONTEST** An essay contest requires that essay entries consist of 500 words with an absolute deviation of at most 30 words. What are the possible numbers of words that the essay can have?

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36. **SWIMMING POOL** The saturation index for a pool measures the balance between the acid level and the amount of minerals in pool water. Balanced water has an index value of 0. Water is highly corrosive or highly scale forming if the absolute deviation of the index value from 0 is greater than 0.5. Find the index values for which pool water is highly corrosive or highly scale forming.

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37. **TAKS REASONING** You are preheating an oven to  $350^{\circ}\text{F}$  before you bake muffins. Several minutes later, the oven thermometer reads  $346^{\circ}\text{F}$ . The measured temperature has an absolute deviation of at most  $2^{\circ}\text{F}$ . Write and solve an inequality to find the possible temperatures in the oven. Should you continue to preheat the oven, or should you start baking the muffins? Explain your choice.



38. **MULTIPLE REPRESENTATIONS** Softball compression measures the hardness of a softball and affects the distance that the softball can travel upon contact with a bat. A softball organization requires that the compression of a softball be 350 pounds but allows an absolute deviation of at most 50 pounds.
- a. **Making a Table** Make a table that shows the absolute deviation from the required compression when the measured compression of a softball is  $p$  pounds. Use the following values for  $p$ : 275, 325, 375, 425, 475.
- b. **Writing an Inequality** Write and solve an inequality to find the softball compressions that the organization will allow. Which values of  $p$  in the table are solutions of the inequality?