

MIXED REVIEW of Problem Solving



Make sense of problems and persevere in solving them.

- MULTI-STEP PROBLEM** A nanotube thermometer is so tiny that it is invisible to the human eye. The thermometer can measure temperatures from 50°C to 500°C .
 - Write and solve a compound inequality to find the temperatures (in degrees Fahrenheit) that the thermometer can measure.
 - Graph your solution of the inequality.
 - Can the thermometer measure a temperature of 1000°F ? *Explain.*
- SHORT RESPONSE** You earned the following scores on five science tests: 75, 82, 90, 84, and 71. You want to have an average score of at least 80 after you take the sixth test.
 - Write and solve an inequality to find the possible scores that you can earn on your sixth test in order to meet your goal.
 - The greatest score that you can earn on a test is 100. Is it possible for you to have an average score of 90 after the sixth test? *Explain* your reasoning.
- GRIDDED ANSWER** You need at least 34 eggs to make enough chiffon cakes for a bake sale. Your grocery store sells cartons of eggs only by the dozen. Of all the possible numbers of cartons that you can buy, which is the least number?
- MULTI-STEP PROBLEM** You have a \$300 gift card to use at a sporting goods store.
 - You want to use your card to buy 2 pairs of shoes for \$85 each and several pairs of socks. Write and solve an inequality to find the possible amounts of money that you can spend on socks using your card.
 - Suppose that socks cost \$4.75 per pair. Write and solve an inequality to find the possible numbers of socks that you can buy using the card.
- OPEN-ENDED** *Describe* a real-world situation that can be modeled by the inequality $17x \leq 240$. *Explain* what the solution of the inequality means in this situation.

- SHORT RESPONSE** A rafting guide plans to take 6 adults on a rafting trip. The raft can hold up to 1520 pounds. The guide weighs 180 pounds and estimates that each adult will bring 10 pounds of baggage.

- Write and solve an inequality to find the possible average weights of an adult such that the raft will not exceed its maximum weight capacity.
- Suppose that the weights of the adults range from 105 pounds to 200 pounds. Can the raft accommodate all the people and the baggage at one time? *Justify* your answer.



- EXTENDED RESPONSE** In 1862 the United States imposed a tax on annual income in order to pay for the expenses of the Civil War. The table shows the tax rates for different incomes.

Annual income	Tax rate
\$600 to \$10,000	3% of income
Greater than \$10,000	3% of the first \$10,000 plus 5% of income over \$10,000

- Write a compound inequality that represents the possible taxes paid by a person whose annual income was at least \$600 but not greater than \$10,000.
- For people whose taxes ranged from \$400 to \$750, tell whether their annual incomes were greater than \$10,000 or less than \$10,000. *Explain* how you know. Then find the possible annual incomes of those people.
- Suppose that the tax rate had been 4% of the total income for people whose annual incomes were greater than \$10,000. For which incomes would paying the 4% rate have resulted in less taxes than paying the tax rate described above? *Explain.*