

**Challenge: Skills and Applications**

For use with pages 63–70

For Exercises 1–8, let  $a > 0$ ,  $b < 0$ ,  $c > 0$ , and  $a > c$ . Write an inequality to compare the two numbers.

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|-------------------|----------------------|
| 1. $a$ and $b$    | 2. $b$ and $ b $     |
| 3. $a$ and $-a$   | 4. $b$ and $-b$      |
| 5. $-a$ and $ b $ | 6. $-a$ and $-b$     |
| 7. $-a$ and $-c$  | 8. $- a $ and $ -c $ |

For Exercises 9–14, tell whether the equation or inequality is true for *some values of  $a$* , for *all values of  $a$* , or for *no values of  $a$* . If it is true for some values, describe when it is true and when it is false.

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|-------------------|------------------------|
| 9. $ a  > 0$      | 10. $ -a  =  a $       |
| 11. $-a \geq  a $ | 12. $-(-(-(-a))) = -a$ |
| 13. $ -a  = - a $ | 14. $-a <  -a $        |

Exercises 15–17 refer to points on a number line and their corresponding numerical values.

- Point  $A$  corresponds to  $-3$  and point  $B$  corresponds to  $5$ . What number corresponds to the point that is three times as far from  $A$  as it is from  $B$ ?
- Point  $P$  corresponds to  $-9$  and point  $Q$  corresponds to  $3$ . What number corresponds to the point that is half as far from  $P$  as it is from  $Q$ ?
- Point  $G$  corresponds to  $-0.9$  and point  $H$  corresponds to  $1.6$ . What number corresponds to the point that is one fourth as far from  $G$  as it is from  $H$ ?