



**Practice Problems**

Solve each inequality. Write the solution and note whether the symbol flips.

- |                          |       |                           |       |
|--------------------------|-------|---------------------------|-------|
| 1. $x + 4 > 9$           | _____ | 9. $3p - 1 \geq 14$       | _____ |
| 2. $n - 3 \leq 5$        | _____ | 10. $\frac{x}{-2} \leq 4$ | _____ |
| 3. $2y < 18$             | _____ | 11. $5 - 3y > -4$         | _____ |
| 4. $-3m > 12$            | _____ | 12. $2a + 9 \leq 1$       | _____ |
| 5. $\frac{t}{4} \geq -2$ | _____ | 13. $-6 + 4t < 10$        | _____ |
| 6. $-x \leq 7$           | _____ | 14. $\frac{n}{3} + 2 > 5$ | _____ |
| 7. $2k + 5 < 13$         | _____ | 15. $7 - 2x \geq -3$      | _____ |
| 8. $-4n + 3 > -9$        | _____ |                           |       |

**Study Tips**

- 👉 **Mark the flip!** Every time you multiply or divide by a negative, write “← FLIP” next to that line so you never forget.
- 👉 Check your answer by plugging a **value well inside** the solution set into the original inequality — not the boundary value.
- 👉 Solutions to inequalities are **infinite sets**, not single answers. Write them as inequalities or graph them — do not list individual values.

**Word Problems**

16. A car’s gas tank holds 14 gal and already has 3 gal in it. The car uses  $\frac{1}{4}$  gal per mile. Write and solve an inequality for the number of miles  $m$  the car can travel before running *out* of gas (tank reaches 0 gal). Should the driver be concerned if they need to drive 42 mi? \_\_\_\_\_
17. Anya is training for a swim meet. Her coach says she must complete more than 120 laps this week to qualify for the finals. She has already swum 35 laps on Monday and plans to swim the same number of laps  $\ell$  each of the remaining 5 days. Write and solve an inequality for  $\ell$ . If she swims exactly 17 laps each remaining day, does she qualify? \_\_\_\_\_
18. Solve the inequality  $-2x + 5 \leq 11$  and graph the solution on the number line shown here. Then check your answer by testing  $x = 0$  in the original inequality.

(graph the solution here)



## Answer Keys

- |  |  |
|--|--|
| <p>1) <math>x &gt; 5</math></p> <p>2) <math>n \leq 8</math></p> <p>3) <math>y &lt; 9</math></p> <p>4) <math>m &lt; -4</math></p> <p>5) <math>t \geq -8</math></p> <p>6) <math>x \geq -7</math></p> <p>7) <math>k &lt; 4</math></p> <p>8) <math>n &lt; 3</math></p> <p>9) <math>p \geq 5</math></p> | <p>10) <math>x \geq -8</math></p> <p>11) <math>y &lt; 3</math></p> <p>12) <math>a \leq -4</math></p> <p>13) <math>t &lt; 4</math></p> <p>14) <math>n &gt; 9</math></p> <p>15) <math>x \leq 5</math></p> <p>16) <math>m \leq 12</math> mi; yes, fuel stop needed</p> <p>17) <math>\ell &gt; 17</math>; exactly 17 does not qualify</p> <p>18) <math>x \geq -3</math>; closed circle at <math>-3</math>, ray right</p> |
|--|--|

### Step-by-Step Explanations

**Strategy:** For Percent Error: How Close Are Your Estimates?, find the absolute error first, then compare it with the actual value. The final percent error should compare the error with the actual value, not the estimate.

**Practice 1:** An estimate is 50 and the actual value is 40. Find the percent error. **Answer:** 25%  
For the first sample, compare the error to the actual value; percent error always uses the actual value in the denominator.

**Practice 15:** An estimate is 7 and the actual value is 8. Find the percent error. **Answer:** 12.5%  
Late in the set, find the absolute error first so the percent error is positive.

**Word-problem notes:**

**16. Answer:** Month 1:  $\approx 28.9\%$  (underestimate); Month 2:  $\approx 5.5\%$  (overestimate); Month 2 more accurate.  
Use the percent error formula  $\frac{|\text{estimate} - \text{actual}|}{\text{actual}} \times 100$ . For month 1,  $\frac{|3.2 - 4.5|}{4.5} \times 100 = \frac{1.3}{4.5} \times 100 \approx 28.9\%$ .  
Because 3.2 is less than 4.5, that prediction was an underestimate. For month 2,  $\frac{|5.8 - 5.5|}{5.5} \times 100 = \frac{0.3}{5.5} \times 100 \approx 5.5\%$ , and since 5.8 is greater than 5.5, it was an overestimate. The smaller percent error is more accurate, so month 2 was better.

**17. Answer:** A:  $\approx 1.3\%$ ; B: 10%; C: 8%. Rank: A, C, B.  
Find each student's percent error using  $\frac{|\text{estimate} - 150|}{150} \times 100$ . Student A has  $\frac{|148 - 150|}{150} \times 100 = \frac{2}{150} \times 100 \approx 1.3\%$ . Student B has  $\frac{15}{150} \times 100 = 10\%$ . Student C has  $\frac{12}{150} \times 100 = 8\%$ . Smaller percent error means greater accuracy, so the ranking from most accurate to least accurate is A, then C, then B.



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