**Solving Absolute Value Equations and Inequalities ⸱ Form A**

**Examples 1-3**

**Solve each equation. Check your solutions.**

 **1.** |4*w* – 1| = 5*w* + 37 **2.** –2|7 – 3*y*| – 6 = –14

**3.** 5 – 3|2 + 2*w*| = –7 **4.** 3 – 5|2*d* – 3| = 4

**Example 4**

**Solve each problem.**

**5. OPINION POLLS** Public opinion polls reported in newspapers are usually given

 with a margin of error. A poll for a local election determined that Candidate

 Morrison will receive 51% of the votes. The stated margin of error is ±3%. Write

 and solve an absolute value equation to find the minimum and maximum percent

 of the vote that Candidate Morrison can expect to receive.

**Examples 5 and 6**

**Solve each inequality. Graph the solution set on a number line.**

 **6.**  + 2 > 10 **7.**  |*x*| > *x* – 1

**8.**  |3*n* – 2| – 2 < 1 **9.**  |2*x* ‒ 1| < 5 + 0.5*x*

**Example 7**

**Solve each problem.**

 **10. MANUFACTURING** A food manufacturer’s guidelines state that each can of soup produced cannot vary from its stated volume of 14.5 fluid ounces by more than 0.08 fluid ounces. Write and solve an absolute value inequality to describe acceptable can volumes, and graph the solution on a number line.

**Mixed Exercises**

**Solve each equation. Check your solutions.**

**11.** ‒6*y* + 4 = |4*y* + 12| **12.** ‒3*y* ‒ 2 ≤ |6*y* + 25|

**REASONING Write an absolute value equation to represent each situation. Then solve the equation and discuss the reasonableness of your solution given the constraints of the absolute value equation.**

**13.** The sum of 7 and the absolute value of the difference of a number and 8 is -2

 times a number plus 4.

**14. SAND** A home improvement store sells bags of sand, which are labeled as

 weighing 35 pounds. The equipment used to package the sand produces bags

 with a weight that is within 8 ounces of the labeled weight.

**a.** Write an absolute value equation to represent the maximum and minimum

 weight for the bags of sand.

 **b.** Solve the equation and interpret the result.

**Solve each inequality. Graph the solution set on a number line.**

 **15.** 3|2*z* ‒ 4| ‒ 6 > 12 **16. 17.**

**18. TIRES** The recommended inflation of a car tire is no more than 35 pounds per square inch. Depending on weather conditions, the actual reading of the tire pressure could fluctuate up to 3.4 psi. Write and solve an absolute value equation to find the maximum and minimum tire pressure.

**~~19. USA A SOURCE~~** ~~Research to find a poll with a margin of error. Describe the poll then write an absolute value inequality to represent the actual results.~~

**20. WHICH ONE DOESN’T BELONG?** Identify the compound inequality that does not share the same characteristics as the other three. Justify your conclusion.

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**21. PERSEVERE** Solve |2*x* ‒ 1| + 3 = |5 ‒ *x*|. List all cases and resulting equations.

 **ANALYZE If *a*, *x*, and *y* are real numbers, determine whether each statement is *sometimes, always,* or *never* true. Justify your argument.**

 **22.** If |*x*|< 3, then *x* + 3 > 0.

 **23. CREATE** Write an absolute value inequality with a solution of *a* ≤ *x* ≤ *b*.